THE RAILWAY GAZETTE
A Journal of Management, Engineering and Operation
INCORPORATING
Railway Engineer · TRANSPORT · The Railway News
The Railway Times · Herapath's Railway Journal · RAILWAY RECORD.
RAILWAYS ILLUSTRATED · ESTABLISHED 1835 · RAILWAY OFFICIAL GAZETTE

PUBLISHED EVERY FRIDAY
AT
33, TOTHILL STREET, WESTMINSTER, LONDON, S.W.1

Telegraphic Address: "TRAZETTE PARL., LONDON"
Telephone No.: WHITEHALL 9233 (8 lines)

Annual subscription payable in advance and postage free
British Isles and Abroad.....£2 5s. 0d.
Single Copies .....One Shilling
Registered at the General Post Office, London, as a Newspaper

VOL. 80 No. 8 FRIDAY, FEBRUARY 25, 1944

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DIESEL RAILWAY TRACTION SUPPLEMENT

The March issue of THE RAILWAY GAZETTE *Supplement, illustrating and describing developments in Diesel Railway Traction, will be ready on March 1, price 1s.*

GOODS FOR EXPORT

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as indicating that they are available for export

NOTICE TO SUBSCRIBERS

Consequent on the paper rationing, new subscribers cannot be accepted until further notice. Any applications will be put on a waiting list and will be dealt with in rotation in replacement of subscribers who do not renew their subscriptions

POSTING "THE RAILWAY GAZETTE" OVERSEAS

We would remind our readers that there are many overseas countries to which it is not permissible for private individuals to send printed journals and newspapers. THE RAILWAY GAZETTE *possesses the necessary permit and facilities for such dispatch.*

We would emphasise that copies addressed to places in Great Britain should not be re-directed to places overseas

TO CALLERS AND TELEPHONERS

Until further notice our office hours are:
Mondays to Fridays 9.30 a.m. till 5 p.m.
The office is closed on Saturdays

ANSWERS TO ENQUIRIES

By reason of staff shortage due to enlistment, we regret that it is no longer possible for us to answer enquiries involving research, or to supply dates when articles appeared in back numbers, either by telephone or by letter

ERRORS, PAPER, AND PRINTING

Owing to shortage of staff and altered printing arrangements due to the war, and less time available for proof reading, we ask our readers' indulgence for typographical and other errors they may observe from time to time, also for poorer paper and printing compared with pre-war standards

Better Home Railway Dividends

THE home railway companies last week provided a pleasant surprise for stockholders by the announcement of increased dividends on the junior stocks. Southern Railway deferred stock is to receive 2 per cent. for 1943, which compares with a payment of 1¾ per cent. for the previous year, and is the largest distribution on the deferred since 1929. An increased payment is also announced by the London & North Eastern Railway Company on its 4 per cent. second preference stock, which is to receive a final dividend of 1¾ per cent., against a final of 1⅝ per cent. last year. This will bring the total for the year up to 2¾ per cent., against 2⅝ per cent. for 1942. This is the highest dividend on the stock since the full rate was forthcoming for 1930. The London Passenger Transport Board is raising its distribution on its "C" stock with a payment of 2 per cent., making with the interim of 1¼ per cent. paid in August, 1943, a total of 3¼ per cent. for the year against 3 per cent. for the whole of 1942; this is the highest payment since 4 per cent. in respect of 1938. The Great Western Railway Company is again paying a final of 2½ per cent., making 4½ per cent. for the year, on its consolidated ordinary stock. As previously announced, the London Midland & Scottish Railway Company is repeating its dividend of 2½ per cent. on its ordinary stock.

Net Revenues and Allocations

The total net revenue of the Southern Railway Company was £6,999,186, or £85,672 more; £89,996 was brought in, and £7,089,182 was available for distribution. After meeting the interest and dividends on the pre-ordinary stocks, the amount available was £2,094,737, and the balance carried forward after all charges is £85,602, which compares with £89,996. On the L.N.E.R. on the other hand the net revenue for £10,655,441 was lower by £45,158. There was, however, a profit on the realisation of investments of £135,419 which did not occur the previous year, and £78,476 (against £86,675) was brought in, so that the total available at £10,869,336 showed an increase of £82,062. The directors are again placing £200,000 to contingency fund, and after payment of debenture interest and the dividends, the balance carried forward is £80,110, or £1,634 more than a year ago. On the G.W.R. net revenue rose £7,236 to £6,939,982, and after meeting interest on dividends the amount carried forward is £293,453, compared with £275,077 a year ago. London Transport net revenue of £4,747,280 compared with £4,882,917, and included a profit on the realisation of an investment, and £57,487 arising from an adjustment of the board's estimated portion of the Railway Control Pool for the year 1940. The balance available for the "C" stock was £845,899 against £802,470.

Railway and Coal Wage Costs

Basic costs in both the coal mining and the railway industry, in normal times, find a speedy reflection throughout practically the whole range of products of British trade and industry. Fuel costs necessarily are almost universally widespread in their incidence, and railway costs are a factor at many stages of distribution for an equally large range of goods. The cost of coal, of course, is of considerable moment to the railways, which use some 15,000,000 tons of it each year. Although the special wartime financial arrangements relating to both these basic industries result in changes in their costs being less apparent than would be the case normally, it is important to note certain of the alterations which are taking place during the war. Among them must be included the very steep rise which has occurred in the wages bill of both industries. To what extent the increases in wages may be justified, the relation they bear to those of other similar groups of workers, or the disparity, in present circumstances, between "real wages" and "money wages" may be argued at length.

Increased Burden

The fact remains, however, that as a result of changes in wage levels, both the railway and coal industries now have to bear a greatly increased monetary charge for their labour. In the last pre-war year the total amount paid in salaries and wages by the railways was approximately £105,000,000; at the present time it is of the order of £192,500,000. A recent answer to a question in the House of Commons showed that from the middle of 1941 to the middle of 1943 the average half-yearly wages bill in the coal-mining industry had risen from £67·1 millions to £90·4 millions, and these figures, of course, were exclusive of the recent Porter award. On February 16 the Minister of Fuel & Power stated that the effect of the various increases to

meet rises in the cost of living index and the attendance bonus had been to raise miners' wages by sums now running at the rate of £74,000,000 a year. The extent of these advances is sufficient to indicate one problem which will face these two major industries after the war, and of which very little has been heard in the welter of post-war plans.

British Investments in Chile

The return on British investments in Chile, as quoted in the London Stock Exchange lists at the end of 1943, was 1·8 per cent., or the same as that for the previous year. The amount of British capital invested in the railways of that country on December 31 last was £17,215,092, on which interest of £208,804, or 1·2 per cent., was forthcoming. The amount on which no interest was paid was £10,282,944. There was an increase of about £1,000,000 during 1943 in the amount of British capital in Chilean railways, as quoted in the Stock Exchange lists, and the average rate of interest showed an improvement of 0·1 per cent. On the other hand the amount receiving no remuneration was 59·7 per cent., which compared with 57·1 per cent. in 1942. These figures include the stocks of the Antofagasta (Chili) & Bolivia Railway Co. Ltd., although a substantial part of that company's system is in Bolivia. The average return received last year was the highest since the outbreak of the war, but the average interest received on railway investments in Chile has been very low for a number of years; it has been below 2 per cent. since 1931, when it was 3·8 per cent.

Indian State Railways

For the year ended March 31, 1943, the Indian State Railways showed the record net surplus of £33,802,500, or nearly £7,000,000 more than the revised estimate given by Sir Edward Benthall, Member, War Transport Department, Government of India, in his budget speech a year ago. Out of the surplus, the Railway Board was able to repay the outstanding loans taken from the railway depreciation reserve fund and to pay off the railways' arrears of contributions to the general revenues of the Indian Government. Total payments to general revenues out of surplus amounted to £15,097,500. Introducing the railway budget for 1944-45 on February 16, Sir Edward Benthall announced a proposal to increase passenger fares (as foreshadowed in our last week's issue); the increase proposed is of 25 per cent., to be effective from April 1, and would yield, it is estimated, additional earnings of £7,500,000, which amount would be placed to railway reserve for improving lower-class travel amenities. Traffic receipts in 1944-45 are expected to total £144,000,000, against more than £133,750,000 in 1943-44. The estimates show a surplus of over £32,750,000 in 1943-44, and of more than £39,000,000 in 1944-45, and provide about £12,650,000 for depreciation and some £21,650,000 for interest.

Allocation of Funds

Of the Indian railway budget surplus for 1943-44, about £24,250,000 will go to general revenues, and more than £8,500,000 to the railway reserve fund. The surplus of commercial lines for 1944-45, after the earmarking of £7,500,000 for amenities for lower-class passengers, will be divided between general revenues and railways in the proportion of three to one. The depreciation fund balance will be about £66,000,000 at the end of 1943-44, and over £61,500,000 by the end of 1944-45. The balance in the railway reserve fund at the end of 1943-44 is expected to be over £15,500,000, and at the end of 1944-45, about £31,250,000, including about £7,500,000 for amenities. The programme for expenditure from the capital and depreciation fund during 1944-45 provides for £38,750,000 (including over £12,650,000 for locomotives).

Canadian Railway Research and the War

It is not only in the primary field of providing transport that the Canadian National Railways have been helpful to the war industry of the nation. The Research & Development Department of the system has voluntarily contributed much to the success and relative economy with which huge wartime undertakings have been conducted. Its services have been available to government and private industry alike, and it has made many of the economic studies that finally determined the location of major industrial operations. Every project has had problems peculiar to itself, but all requiring a careful analysis of such general locational features as labour supply, sources of raw materials, power supply, and topography, and a detailed study of relative transport costs, to determine where such operation should be located to fulfil its function adequately at a minimum cost to the country in time as well as money. The department's knowledge of the country as a whole, its wealth of statistical data, and its experience in interpreting and correlating such data, have resulted in its facilities being in constant demand by those responsible for producing the nation's armament. The department has also rendered important assistance in the solution of problems connected with establishing at strategic points across the country the many large stores of war materials awaiting shipment overseas.

Transport to the Crystal Palace

Post-war plans for rebuilding the Crystal Palace have resulted in an interesting correspondence in the columns of *The Times*, much of which has been devoted to a consideration of social amenities and recreational needs. Most of the writers have accepted the adequacy of the transport facilities, and it is, therefore, with considerable surprise that we read a letter from Sir Garrard Tyrwhitt-Drake criticising the transport access to the Crystal Palace, mainly on the grounds that a bus journey from the West End or the walk through corridors and stairs from the low-level railway station are long and tiring. Of the bus facilities, we can only remark that they are numerous and good; the use of local buses for longer through journeys than they are designed to serve is, of course, tiring, but is unnecessary. From its earliest days, the Crystal Palace has been served by excellent rail facilities; first, by a branch from the main L.B. & S.C.R. line from London Bridge; then by a separately-promoted railway to the West End; and, finally, by the L.C. & D.R. line to the high-level station. All these are electrified, and have good services, and as long as the Crystal Palace stood there were combined travel and admission bookings. We do not agree that the Crystal Palace was behind the times in regard to quick and cheap rail access, and we are sure that its fate will not be affected adversely by any failure of the railway services.

Strengthening Bridge Spans

The problem of strengthening bridges to meet ever-increasing vehicle loadings is universal, and the methods employed to meet this end are numerous. They vary from reinforcing plate girders or joists with cover-plates, to duplicating main girders, reinforcing them with bowstring or other forms of subsidiary truss and converting simple into continuous spans by the insertion of intermediate piers. The first variety of method is common practice in almost all countries, whereas the second, duplication, can be used only when and where steelwork is plentiful and exactly similar additional girders are available, or can be fabricated from longer spans without much difficulty. Reinforcement by adding bowstring and other trusses above the old girders—whether of the plate or truss type—or with underslung trusses is, however, normally more economical, and has been resorted to recently on the Parana Railway in Brazil. An excellent example of the overhead additional truss reinforcement is to be seen much nearer home, namely, in the Borough Road bridge on the Loughborough Junction-Ludgate Hill section of the Southern Railway. Conversion of simple into continuous spans has also found favour on the Parana system, but it can be adopted only where an intermediate pier is feasible. It also entails the reinforcing of webs or web members for compression or shear at the centres of the main girders and, moreover, some provision—such as counterweighting at the abutments—to provide against live load negative reactions and hammering on the abutment bearings.

Passenger Accommodation in South Africa

In view of the tendency within recent years for passenger class distinctions to be simplified in most European countries, it is apt to be overlooked that in some parts of the world differences of race and colour provide considerable complications for railway administrations. For example, we have just been looking through the official railway tariff book of the South African Railways & Harbours, the management of which is authorised to set apart, where practicable, any portion of a train for males or females, persons of particular races, or different classes of persons, or natives. The management may refuse to carry a passenger in any other portion of the train than that reserved for his kind, and stationmasters, guards, and other specified officials are authorised to remove a passenger from one compartment to another without assigning a reason. Moreover, the administration may refuse to issue a first or second-class ticket to any passenger, who, in the opinion of an official, may not be dressed in a decent or clean manner. Portions of railway premises, refreshment cars, and conveniences, may be restricted similarly. On the other hand, no third-class tickets are issued to white passengers within the Transvaal, excepting on the three sections of the line in the neighbourhood of Johannesburg. White passengers to and from branch lines connected with these sections

are required to pay second-class fare over such branch lines. The administration reserves to itself the discretion to grant written permission for a non-European female nurse holding a valid ticket and accompanying her European mistress, who is travelling by train with small children, to visit, at reasonable intervals during the daytime, the compartment in which her mistress is travelling for the purpose of assisting with the children, providing other passengers do not object. Such are examples of the special provisions which railway administrations are called upon to make, and which naturally tend to limit effective train loading.

■■■■

A Text Book for Shunters

Among the voluminous reading matter prepared for the use of railway staff, there are many text books relating to the mechanical and civil engineering side of the industry, but traffic operation, more particularly as it affects the lower grades, does not figure so largely. Engine crews also have facilities for getting to know more of their occupation and gaining greater skill, through the medium of improvement classes, and so forth. It might not be a bad thing, with a view to increasing efficiency of operating, if improvement classes for shunters were instituted. On another page we review, at some length, a new book by Mr. Edward S. Hadley, author of "Railway Working and Appliances." It is described as a practical guide to ways of saving time, work, and engine power in shunting and marshalling. This book may well serve a useful purpose in promoting discussions among those engaged in shunting operations as to the best means of performing the essential task. Obviously, it would be better that these discussions should take place at specified times, rather than haphazardly during mealtime breaks, and so forth.

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An Interesting Power Frame Renewal

Our contemporary, *Railway Signaling*, gives details of an interesting power frame renewal carried out recently on the Long Island section of the Pennsylvania at Jamaica, Long Island. Over 700 trains are dealt with on an ordinary week-day at the signal box concerned. The original 123 lever frame, installed in 1913, was of the electro-pneumatic type, much favoured by many lines in the U.S.A.; the levers were really handles turning sideways to the signalman on spindles passing from back to front of the frame, seen in this country only in the first e.p. installation opened at Bishopsgate Goods Station, G.E.R., in 1890. It was not practicable to assemble the new frame alongside the old in the box, nor was it desired to use an external temporary portion. There was sufficient height to enable it to be erected above the existing one on special timbers. After all the wiring was completed the changeover to the new frame was made and full working resumed in 8 hours, starting at midnight on a Saturday. The old frame was then dismantled and removed and an elaborate process of lowering the new one, weighing about 9 tons, into its place begun, with the aid of 36 screw jacks and support pieces. This had to be carried out with the utmost care, inch by inch, and occupied about 28 hours, inclusive of the time taken to remove the old frame, 50 men being engaged on it. The traffic was satisfactorily carried on without interruption.

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A Locomotive Boiler Failure

Late on November 17, 1943, an American locomotive working a goods train westwards from Banbury was approaching Honeybourne, on the Great Western Railway, when the firebox crown collapsed. The fireman received scalds which soon afterwards proved fatal, though in the darkness and confusion on the footplate their extent was not fully realised at once. Nevertheless, with great fortitude, he walked nearly a mile to a signal box to get assistance. The curious circumstances of this accident are well brought out in the official report, which we reproduce in abridged form on p. 198. The collapse was due to shortage of water, and it was considered that the enginemen were misled by the water gauge showing a false level, due to the steam valve not being fully open. As British drivers have been accustomed to water gauges with plug cocks, which reveal at a glance whether they are open or closed, the possibility of the screw valve, which is fitted to these engines, being only partially open, and the serious effect thereof, had not been generally appreciated hitherto. The experimental plant which the company set up to explore the extent of the false reading has placed the true cause of failure beyond all reasonable doubt. An excellent tribute, by implication, was paid to the boiler, with all-steel welded firebox, with which these engines are provided; materials and workmanship were reported to be "of the highest order." The type of fusible plug at present fitted appears to have some undesirable features, and the substitution without delay of a new type is recommended.

London Midland & Scottish Railway Company

THE full report for the year 1943 which has now been issued is given in abbreviated form. It shows with regard to the trust fund under the railway control agreement that the payment to the trust fund in respect of arrears of maintenance, etc., amounts to £20,948,974 by the company and £718,985 its proportion in respect of "J" joint lines. Corresponding figures in the 1942 balance sheet were £16,773,062 and £537,479. Reference is made in the report to the Bills now being promoted by the company. They propose to authorise the company to supply water from the Shropshire Union Canal; to close to navigation certain portions of its canals and to transfer part of the Huddersfield Canals to the Calder & Hebble Navigation.

It is also proposed that 21 days' notice of candidature for the office of director shall be given to the secretary of the company except in the case of directors retiring by rotation and directors elected by the board to fill casual vacancies. Application is also being made to the Minister of War Transport under Section 45 of the Railway & Canal Traffic Act, 1888, for a warrant authorising the abandonment of the Monkland Canal. It it also announced that Mr. Richard Felix Summers has been appointed a director of the company.

Net revenue for the year 1943 amounted to £15,685,609, or an increase of £95,726. After again setting aside £400,000 for wartime contingencies and meeting interest on debenture stocks the balance available for dividends, including £95,013 brought forward, is £10,941,452. After payments at the full rates on the guaranteed and preference stocks, this will admit of a dividend of 2½ per cent. on the ordinary stock, leaving £87,008 to be carried forward.

Dividends on the ordinary stock for the past ten years follow:—

1934	1935	1936	1937	1938	1939	1940	1941	1942	1943
%	%	%	%	%	%	%	%	%	%
Nil	Nil	1¼	1½	Nil	1¼	1½	2	2½	2½

Results for the past three years are given in the following comparative table:—

	1941 £	1942 £	1943 £
Total expenditure on capital account	462,204,750	462,480,127	462,853,797
Joint lines—Company's proportion of net revenue	112,725	112,725	112,725
Miscellaneous receipts (net)	*775,775	*783,759	*776,342
Net revenue	15,250,211	15,589,883	15,685,609
Interest on debenture stocks	4,439,170	4,439,170	4,439,170
Dividends on guaranteed and preference stocks	8,474,383	8,474,383	8,474,383
Balance after payment of preference dividends	2,336,658	2,676,330	2,772,056
Dividend on ordinary stock	1,904,049	2,380,061	2,380,061
Rate per cent.	2	2½	2½
Wartime contingencies	400,000	400,000	400,000
Surplus or deficit (+ or −)	+32,609	−103,731	−8,005
Balance brought forward from previous year...	166,135	198,744	95,013
Balance carried forward to subsequent year ...	198,744	95,013	87,008

* Other than those included in financial arrangements with Government

The miscellaneous receipts (net) include interest and dividends from investments in other undertakings, general interest, and profit on the working of the Northern Counties Railway (Ireland). The profit on this railway was £236,963 in 1943, compared with £259,327 in 1942. The return from passenger road undertakings was £447,508, against £456,504, and from associated road goods undertakings was £52,614, against £51,834. The dividends for the 5 per cent. redeemable preference stock were posted on December 31 last; those for the other stocks will be posted on March 14.

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Great Northern Railway (Ireland)

FOR the year 1943 the gross receipts from the railway amounted to £2,795,292, an increase of £184,775 in comparison with 1942. Railway expenditure, however, was £236,043 higher, at £2,208,351, and the net receipts from railway working fell accordingly from £638,210 to £586,941. Road transport net receipts in Eire were £33,848 against £36,935, but the profit on hotels, and on refreshment rooms and cars rose from £22,328 to £28,661. The total net income of £710,278 compares with £746,549 for 1942. Although interest, rentals, and other fixed charges take £121,486 against £119,236, and the sums reserved for estimated excess profits tax and contingent liabilities have risen from £195,000 to £218,000, the amount reserved for income tax is reduced from £256,102 to £148,737. This has enabled the directors to raise the ordinary dividend from 1¼ per cent. to 2½ per cent. and to increase the amount to be carried

forward. The following table gives the general financial position as compared with that of the previous year:—

	1942	1943
	£	£
Total expenditure on capital account	10,052,929	10,052,929
Gross receipts from businesses	2,896,414	3,102,640
Revenue expenditure on ditto	2,198,941	2,453,190
Net receipts of ditto	697,473	649,450
Miscellaneous receipts (net)	49,076	60,828
Total net income	746,549	710,278
Interest, rentals, and other fixed charges	570,338	488,584
Dividends on guaranteed and preference stocks	114,738	114,738
Dividend on ordinary stock	60,760	101,267
Rate per cent.	1¼	2¼
Brought forward	3,082	3,795
Carried forward	3,795	9,484

Reports of the Great Northern Railway are of particular interest at this time as they give all the information required by the Railways (Accounts & Returns) Act, 1911, which is not now published by any other railway in Great Britain or Ireland. Ordinary passenger traffic in all three classes showed substantial increases both in numbers and receipts, but the revenue from workmen's and season tickets was rather less than in 1942. Total passenger receipts were £1,345,718, against £1,184,480. Parcels, etc., revenue rose from £122,697 to £133,433, and goods train receipts from £1,197,135 to £1,209,289. Merchandise and coal class earnings were markedly better, but there were decreases under livestock and "other minerals." Of the increase of £236,043 in railway traffic expenditure, £203,086 represented the increased cost of salaries and wages, and of locomotive coal. The percentage of traffic expenditure to traffic receipts was 79·38 in 1943, compared with 75·89 in 1942.

The company's stock of steam locomotives consists of 150 tender engines and 40 tank engines. It also has 9 diesel railcars and 2 diesel railbuses. The stock of passenger carriages has been increased from 356 to 362. Goods and mineral vehicles now number 5,601, against 5,536.

Railways (Acceptance of Merchandise) Order

THE necessity for securing the utmost economy in the use of petrol and rubber caused the Ministry of War Transport early in 1943 to issue instructions to its Road Haulage Organisation that traffic should not be accepted for conveyance by road if it could reasonably be carried by other means of transport. The necessary arrangements were made through the Regional Transport Commissioners and their Sub-District Managers, who acted in close liaison with the district officers of the railways, canals, etc., particularly in keeping traffic off the roads when a journey of 60 miles and over was involved.

Appreciable tonnages were then transferred to the railways but, with the approach of autumn, the continuous increase in the already extremely heavy tonnages passing by railway, accentuated by the shortages of labour and wagons, necessitated re-consideration of this policy. As a result, it was decided that it was necessary to increase substantially the amount of the traffic conveyed by road, in order to assist in lightening the load on the railways. The detailed arrangements were made by the Regional Transport Commissioners, who were empowered to designate goods which should not be conveyed by rail in the national interest, although, on occasion, the railway company might have been in a position to accept the traffic.

Difficulties soon arose, as the statutory obligations of the companies as "common carriers" prevented them from refusing traffic tendered to them for conveyance by rail, even if it had been designated by the R.T.C. for road conveyance. To overcome these difficulties the Minister of War Transport on January 21 issued the Railways (Acceptance of Merchandise) Order, 1944, which provides that, notwithstanding any statutory or other obligation, no railway company shall be bound to accept for conveyance traffic designated by or on behalf of the Minister as traffic which should not be conveyed by railway.

Service to the Purchaser

MANY and heavy demands have been made on the British locomotive building industry during the present war, and the full part that it has played in the national effort will not be known until after the cessation of hostilities. It is common knowledge, however, that it has been instrumental in providing essential motive power for use not only in this country but in many vital war areas, and, from time to time, we have published descriptions of various of the wartime products of the private builders. No less essential than the large main-line locomotives, which have been built for use in Great Britain and abroad, have been the considerable number of shunting engines which have been called for, and for which a section of the British locomotive building industry is well fitted, by experience, to provide. Earlier in the war, when the demand arose for a number of simple and robust saddle tank engines, it was decided that the well-known Hunslet 0-6-0 standard type should be adopted, with such modifications in the original design as might be necessary to facilitate quantity production, despite shortages in certain materials and manufacturing resources. To ensure speedy production of the requisite number of engines, several locomotive builders were required to undertake production, and this was performed with the greatest measure of co-operation in the national interest. The Hunslet Engine Co. Ltd. made its designs and drawings freely available to what might, in more normal times, be deemed to be competing interests, and, indeed, went further in that its technical experts visited the works of other builders to give all possible assistance.

The shunting locomotives then produced are now in a variety of hands, and to assist those now using its products, the Hunslet Engine Co. Ltd. has published a spare parts list, which should go far towards making the ordering of replacements as simple as is reasonably possible. On another page we give some details of this list, and reproduce from it certain of the illustrations. From these it will be apparent that the job has been tackled methodically and comprehensively. Moreover, by giving, in effect, standard names to the multifarious components of a locomotive, the Hunslet Engine Co. Ltd. may have gone some way towards providing a basis for arriving at a fixed description of parts. In the past it has happened not infrequently that the wide variety of terms used in locomotive circles has led to some slight confusion, or to delay in securing replacements. Provided that the descriptions given in the list are followed when spare parts are ordered from the makers, this should be eliminated in the case of the Hunslet shunter.

Lists of this kind should have a wider application, and be of greater value perhaps, in the post-war years. With the return of peace and of the British locomotive industry to the export trade, considerable value will attach to the ability to make available to overseas customers lists such as that prepared by the Hunslet Engine Co. Ltd., and the resultant simplification in renewing any spares or replacements that may be required from time to time. The compilers of the list are to be congratulated on providing an additional service to their customers, and one which should prove its value, not only at the present time, when, no doubt, it will be of assistance to those who may be handling these engines for the first time, but also after the war, when these engines may find a still wider circle of usefulness.

Transit of Heavy Packages by Passenger Train

A FEATURE of wartime transport has been the substantial increase in the number of heavy packages forwarded by passenger train. Many of these packages are of such bulk and weight as to present very real difficulties in loading and unloading, and numerous heavy delays to passenger services are directly attributable to overtime at stations dealing with such consignments. The position is further aggravated by the fact that platform staff today largely consists of women and youths who lack the physical capacity to handle expeditiously the heavy consignments now passing by passenger train. At many stations it has been necessary to supply special equipment to facilitate the handling of the consignments, but even so it is frequently impossible to avoid delays to trains.

As long ago as February, 1942, the Minister of War Transport issued an Order known as the Limitation of Packages by Passenger Train Order, 1942, which was designed to restrict the transit of heavy consignments by passenger services. This Order provided that no package exceeding one hundredweight should be accepted for conveyance by passenger train except by previous arrangement. For the guidance of stationmasters and other officials responsible for deciding what packages should be accepted for transit by passenger train it was laid down that such consignments should (1) be of importance from a national point of view, for example, come within the priority categories (2) could not reach destination in time if sent by goods train and (3) could not reasonably be expected to be split up into a number of smaller packages. Traffic in the priority categories includes consignments of Government traffic, and essential traffics such as foodstuffs, medical stores, feeding stuffs for livestock and poultry, agricultural and vegetable seeds, A.R.P. stores and equipment, and telegraph and telephone stores. Fish and milk are excepted because of the impracticability of replacing a large number of standard boxes, barrels, and churns.

Notwithstanding the provisions of this Order, a very large number of consignments considerably in excess of the prescribed weight continues to be forwarded by passenger train. Many are indisputably urgent and strictly conform to the conditions

laid down; on the other hand there are numerous instances in which it is at least doubtful if the degree of urgency is such as to justify the privilege of passenger train transit. Similarly, there is reason to believe that some of the heavy packages tendered for conveyance by passenger train could, with little difficulty, be split into two or more smaller packages. The majority of consignments of exceptional weight conveyed by passenger train are forwarded by or on behalf of Government Departments and it is difficult for railway officials to satisfy themselves as to the real need for passenger train conveyance; in these circumstances, the decision to accept such traffic must rest largely on the assurance of the senders that the consignments in fact do conform to the conditions laid down in the Order. On the other hand, consignors themselves are frequently in a difficult position; for example, it may be necessary, in the case of urgent traffic for shipment, to resort to passenger train transit to ensure arrival at the port by a specified time, although, in the event, late arrival of the ship through unforeseen circumstances would have given plenty of margin for conveyance by freight train. Such instances are unavoidable, but appreciable relief would be secured by the railways if strict regard was paid to the provisions of the Order, thus obviating the overburdening of passenger trains with traffic which could reasonably be despatched by freight services.

Locomotive Eccentrics

IT is now some twenty-five years since the former Great Northern Railway, by providing ball bearings on the return cranks of its first three-cylinder 2-8-0, gave a lead in this method of reducing the amount of energy lost in friction in the various components of locomotive valve gears. This innovation was so successful that it has been continued as the standard type of bearing for the Walschaerts valve-gear eccentrics of all subsequent G.N.R. and L.N.E.R. engines having that type of steam distribution. The design was very compact; it was little larger than the equivalent plain-bushed bearing of contemporary designs, and was very easy to dismantle. Grease-cup lubrication was incorporated, with entirely satisfactory results.

It is a great pity that so admirable a type of eccentric could not have been adapted to the requirements of the thousands of locomotives with Stephenson's or Walschaerts valve gear, which have their eccentrics between the frames. The difficulties to be surmounted, however, are so great as to outweigh any advantages likely to be gained. In the first place, if driving wheels and axle are to be a fixed assembly, the use of solid ball or roller races is precluded. In any case, a bearing of perhaps 1 ft. 9 in. bore would be necessary, and the large size of both race and housing would make the cost prohibitive.

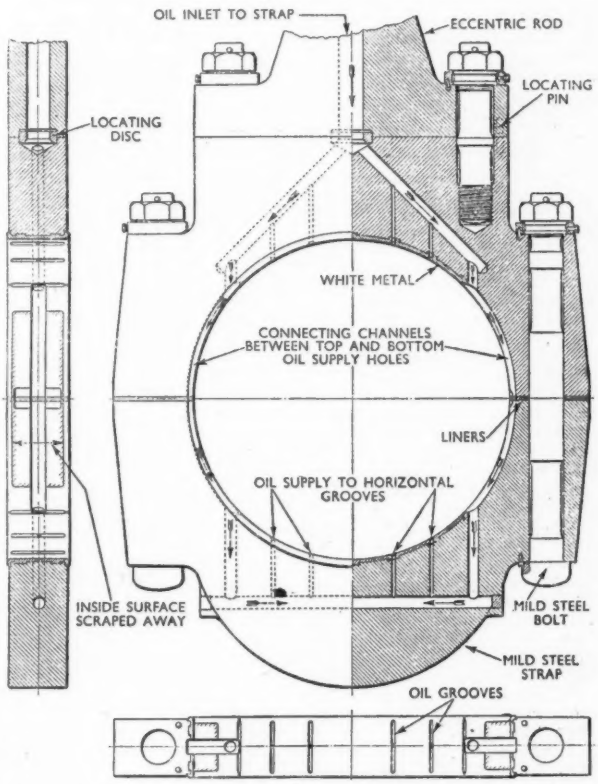
Although, theoretically, a split bearing might provide a solution, practical considerations rule it out altogether. The speed of rotation of a locomotive is rather high for an eccentric bearing of the size that inside eccentrics would render necessary; moreover the large diameter would in turn give rise to an undesirable increase in the weight of the reciprocating parts. Lubrication difficulties could also be expected. Finally, the existence of the "split" in the bearing would itself tend to nullify much of the reduction in friction that such a bearing was intended to achieve.

As there is little hope for anti-friction bearings in locomotives having eccentrics placed "inside," one may ask what other directions may be explored in an attempt to secure the best possible type. Literature on the subject of locomotive eccentrics is so scanty as to suggest that these vital details of so many engines are generally taken for granted and that there is little or no inducement—mechanical or economic—to consider any radical changes. Pettigrew in his classical "Manual of Locomotive Engineering" (Charles Griffin, London) gives a few empirical rules for the proportioning of eccentrics and rods, but little else. Lubrication arrangements are dismissed by him in a cursory sentence: "The strap is generally of cast iron and is provided with a lubricating arrangement." Failure to secure adequate lubrication of the straps and sheaves is undoubtedly one of the principal reasons giving substance to the old, familiar accusation that the eccentrics absorb a large amount of energy in friction. Yet if a little more care were expended, greater advantage could be taken of certain favourable factors. The movement of an eccentric is more smooth than that of a crankpin, as no sudden shocks occur at the ends of its stroke. Moreover the pressure between strap and sheave is continually varying, each end receiving it alternately—an effect which enables the oil to spread itself between the surfaces.

The lubrication arrangements almost invariably take the form of an oil reservoir or cup with a trimming, incorporated in the portion of the eccentric strap to which the rod is attached. Since the strap is in two portions, there is a tendency, as a result of wear, for it to open slightly at the joint. If oil is (as usual) only supplied to the front portion of the strap, the other half is unlikely to get its proper amount of oil. An immense step forward is represented by a comparatively little-known design in which *each* portion of the strap has its own oil cup and trimming; the difficulty of inserting the large bolt which holds the two portions together is overcome by locating the two oil cups asymmetrically with regard to the centre line of the bolt.

Perhaps, however, there is something to be learned from the makers of the steam locomotive's chief rival, the heavy-oil engine. One of the latest designs of double-acting two-stroke engines produced by Harland & Wolff Limited, of Belfast, was described in some detail by Mr. C. C. Pounder in the Fifteenth Thomas Lowe Gray Lecture to the Institution of Mechanical Engineers.* These engines were provided with a masterly design of eccentric strap, embodying a system of oil-supply holes and grooves which are worth serious consideration by any locomotive designer. The general effect is to provide for a supply of oil at multiple points around the whole circumference of the sheave. The design is shown herewith. Mr. Pounder states:

"To older marine engineers, probably the most interesting feature of this engine is the eccentric drive, which operates the exhaust pistons and transmits their power to the crankshaft. Many such engineers, with recollections of the old-time steam eccentric—grunting, in its trough of soapy water, as if in perpetual protest against its designer's violation of every law of lubrication—can never completely accept the simple fact that an eccentric is a crank which, if properly made, can very effectively be used for the transmission of power. That the diesel engine eccentric strap is a very different thing from the steam engine contrivance will readily be realised from the accompanying illustration."



There is, of course, one vital difference in working conditions: the heavy-oil engine is of the enclosed type with forced lubrication, and the steam locomotive is a hand-lubricated open engine. Nevertheless, the same principles could certainly be used in adapting the vertical-engine eccentric shown herewith to the horizontal type required in a steam locomotive. So far as is known, no patents have been taken out for an eccentric and strap of this type as adapted to steam railway locomotive requirements; undoubtedly a trial installation would furnish results of considerable value.

* Proc. I.Mech.E., 1943, vol. 150, p. 39 "Some Types of Machinery Available to Shipowners"

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

Railways after the War

Chinthurst Lodge, Wonersh,
Guildford. February 18

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—The article in your February 18 issue, entitled "The Railway Stockholders' Manifesto," ends with the suggestion that the Government will recognise the services they [the railways] have rendered to the nation and will take steps to ensure that their post-war earnings are sufficient to maintain their undertakings in a state of efficiency.

Do you consider that this is all that is to be expected of the Government? Are not the stockholders entitled to some remuneration for the use of their capital?

Yours faithfully,
C. F. DENDY MARSHALL

Plain and Roller Bearings

The Eyre Smelting Co. Ltd.,
Tandem Works, Merton Abbey,
London, S.W.19. February 15

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—We have noticed on several occasions that when referring in your columns to roller bearings and plain bearings you describe the latter as "friction" bearings, and we should like to point out that the use of the word "friction" in this connection has no justification technically or from the point of view of common usage.

From the technical point of view every type of bearing is subject to friction and comparison can only be made on a relative basis. If and when a frictionless bearing is invented we shall be a lot nearer the era of perpetual motion than we are today.

From the point of view of common usage, it is only necessary to point out that tin-base and lead-base bearing alloys are known universally as anti-friction metals and that they are described in this way by engineers throughout the world. Furthermore, this description is fully justified in that these alloys were designed to reduce friction, in which direction they have been markedly successful.

It is not our intention to discuss the relative merits of a properly designed and lubricated plain bearing with those of a roller bearing, but we do wish to protest strongly against this disparaging reference in your columns to plain bearings. It cannot but tend to prejudice those users who have had no opportunity of investigating the matter for themselves, and as bearing metal specialists of long standing, and we hope of progressive outlook, we feel justified in registering this protest. Or would you suggest that in future advertisements in your publication we should describe our products as "friction metals"?

Yours faithfully,
C. R. LASKY,
Railway Department

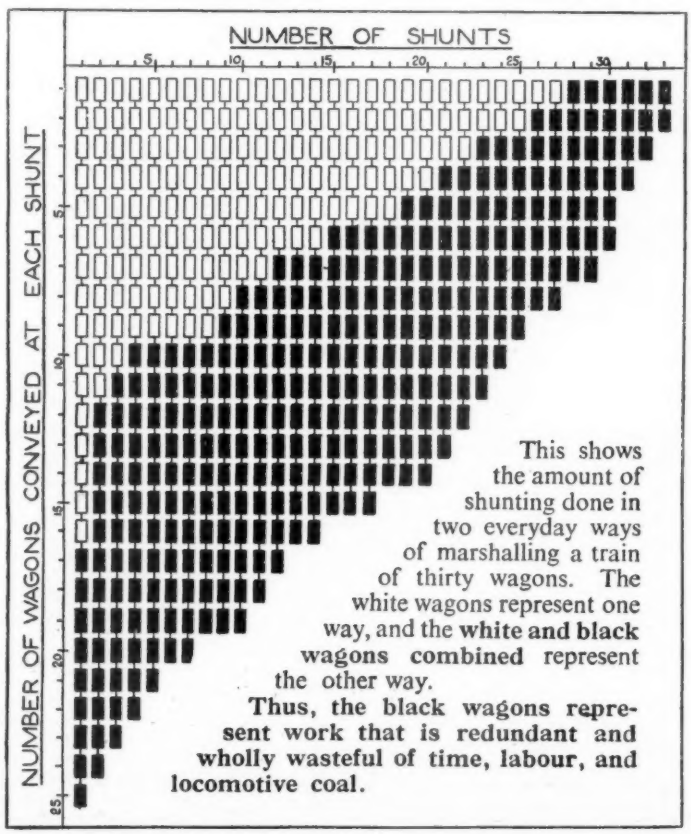
[Our correspondent presumably refers to an editorial note which appeared in our issue of January 14, page 30, in which reference was made to the latest developments of application of roller bearings to American locomotives. Apparently, the term "friction bearings" has been coined by American protagonists of roller bearings. It is generally agreed, however, in a well designed journal bearing under proper conditions of maintenance the energy absorbed in friction is very small and it is therefore incorrect to refer to such bearings as friction bearings. The term "journal bearings" is much more in line with accepted usage in this country and we will see that this form is used in future.—ED. *R.G.*]

Publications Received

The Shunter's Manual: A Practical Guide to Ways of Saving Time, Work, and Engine Power in Shunting and Marshalling. By Edward S. Hadley. Published by the author at 42, Milton Road, Hanwell, W.7. 7¼ in. × 4¾ in. 48 pp. Paper covers. Price 3s. net.—There is not an abundance of literature for those whose railway duties are concerned with the movement of wagons in the traffic marshalling yards and at the sidings connected with goods and coal depots, stations, and colliery, etc., premises, and therefore the author is to be commended on his contribution which is described as "A practical guide to ways of saving time, work, and engine power in shunting and marshalling." The title of the handy booklet is perhaps a little ambitious, as it does not, and could not at the price embrace all forms of shunting, gravitation, hump, etc., nor the whole technique involved in the handling of wagons, braking and actual point operating, and in breaking up and making up freight trains, embraced in the more familiar general term "shunting."

The subject-matter dealt with is primarily that of separating and marshalling in appropriate order, for detaching at successive stopping places on the train journey or depositing in particular sidings, batches of wagons which are mixed, that is, for different destinations and generally known as "rough," by the ordinary process of flat shunting by locomotive, and it is clear from the numerous illustrations included that the author has been at considerable pains to work out the processes and to arrive at his conclusions.

Although the shunting of wagons does not enjoy the publicity given to some other branches of railway work there can be a certain fascination in juggling with them, born perhaps of the same attraction which most juveniles (and some adults) have for the home-operated miniature railways and model rolling stock and equipment. To play with "grown up" engines and wagons must be the height of many a child's ambition and the jig-saw puzzle often involved in pulling a train of wagons to pieces and putting it together in a different order within the limitations imposed by rails and wheel flanges is, or should be, as stimulating mentally as a cross-word puzzle. But there is more than amusement in the process, at least from the point of view of the railway companies, for shunting at its best is a "necessary evil" and lends itself to waste, and consequently needless expense and time. This really forms the jumping-off ground, and the author proceeds to stress the benefits to be gained from


NUMBER OF SHUNTS
5
10
15
20
25
30
NUMBER OF WAGONS CONVEYED AT EACH SHUNT
5
10
15
20
25
This shows the amount of shunting done in two everyday ways of marshalling a train of thirty wagons. The white wagons represent one way, and the white and black wagons combined represent the other way.
Thus, the black wagons represent work that is redundant and wholly wasteful of time, labour, and locomotive coal.

a greater application of the mental faculties in deciding between which vehicles the successive uncouplings shall be done, and how the respective portions shall be deposited temporarily on such siding accommodation as may be available, during the backward and forward movements by the engine concerned in the shunting operation, and in the often numerous moves requiring to be made before every wagon is in its right order. In other words it is a case of "more brains, less brawn" which will save time and expense, not to mention the reduced physical effort of the men concerned in carrying out the complete operation of marshalling a train in required order.

Quite obviously it is impossible to lay down rules which will cover every combination, and much depends on the incidence of the mixing. Circumstances may exist which give little scope for originality, but with the aid of Illustrations the author describes in considerable detail how a given composition of a train should and should not be shunted, and in his introduction he states he enlisted the views of a number of shunters with practical railway experience in his endeavour to focus on the best arrangements.

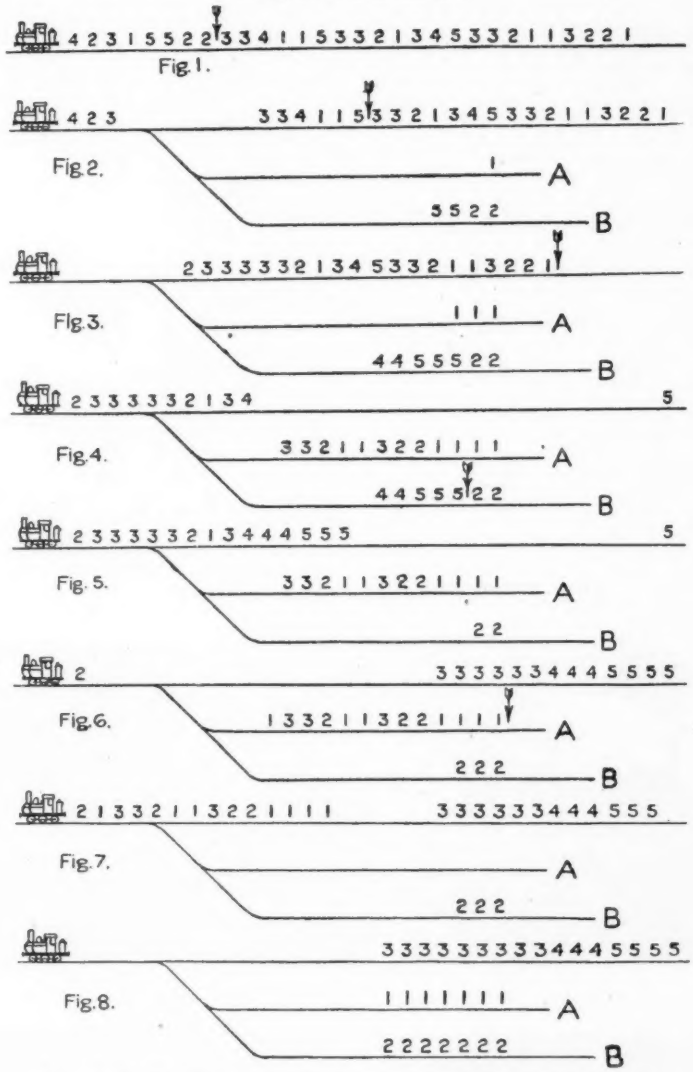
There is not usually time in actual practice to make out a list showing the formation nor to sit down and plan all the moves beforehand, especially if the train is of any length. Many individuals have their own technique whether based on rule of thumb methods or on a more scientific outlook. Much of such work is carried out at isolated places remote from higher grade supervision and the man concerned acts on his own as he chooses. Without, however, belittling the intelligence displayed by the shunting staff of, say 50 years ago, many of whom could do their work as well as their sons and grandsons, it is safe to say that the spread of education has evolved a class containing many, who, shall we say, are more mathematically minded.

To the shunters, guards, etc., engaged upon, as well as supervisors over, the class of work described, we can commend Mr. Hadley's book at least as an inspiration to apply a still more scientific outlook to the subject under review.

EXAMPLES AND EXERCISES

Ex. B.— With the first cut-off behind a No. 2

Wagons taken on 7 times; put off 22 times; average number conveyed at each shunt, 7



One of the illustrations given in the handbook showing shunting movements. The arrows indicate cuts

Mechanical World Year Book, 1944. 57th Edition. Manchester, 20: 78, Palatine Road. London: 28, Bedford Street, W.C.2. 6¼ in. × 4 in. 266 pp. Price 2s. 6d. net.—On account of the war, engineering and allied industries are absorbing an ever increasing number of persons to all of whom this handy and still remarkably cheap technical book of reference will be of great value. As in previous years there are numerous tables and aids to calculation of direct practical use in the workshop. Useful tabulated data are also given in the descriptive sections which relate to such subjects as light alloys, plastics, die-casting, press-tool work, and welding among many others. Plant operators will be interested in the sections on steam boilers, turbines and internal combustion engines. The section on toothed gearing is authoritative and can be recommended to designers.

Electrical Year Book, 1944. Manchester, 20: Emmott & Co. Ltd., 78, Palatine Road. London, W.C.2: 28, Bedford Street. 6¼ in. × 4¼ in. 333 pp. Price 2s. 6d. net.—As a source of general information on electrical matters, this annual publication maintains its high reputation. Even a casual glance through it shows what a wealth of tabular and other data it contains, and that it is extraordinarily good value for its modest price. Most of the familiar features have been retained this year in a similar form to the 1943 edition, and the section on traction is unaltered. Elsewhere there is additional matter on single-phasing of three-phase induction motors, on the commutators of certain a.c. motors, on frequency changers for high-speed drives such as wood-working machinery, and on d.c. and a.c. potentiometers. Some new material has been provided to deal with transformer tests and with the determination of the capacitance of large condensers. Elsewhere other minor revisions and additions have been made to keep the text thoroughly up to date. Production is inevitably below peacetime standards, but there is so little of austerity in the general make-up that the lowering of the standard is hardly noticeable.

Heroes of Road and Rail.—Edited by George C. Curnock. London: Simpkin Marshall (1941) Limited, 12, Old Bailey, E.C. 4. 7½ in. × 5 in. 98 pp. + 47 photographic reproductions on separate plates. Price 7s. 6d.—One of the outstanding features of the period of heavy air attack during the winter of 1940-41 was the heroism of the transport workers on both the railways and roads of this country. Many stories of this have been told, often in the daily press, when security permitted, and subsequently in the stilted phraseology of *The London Gazette* citations, in those cases where courage and devotion to duty had come under official notice and been rewarded by medal, etc. A permanent and illustrated collection has its own advantages, however, and this is what the present volume is designed to supply. The illustrations are well chosen, and many of them are reproductions of photographs not previously published. So far as is possible, the text is in the simple and modest words of the individual hero.

The Scrap Heap

Railway passengers are buying portable stools and shooting sticks, which open to form seats, for use in corridors on long journeys.—*From "The Evening News."*

* * *

Every week more than 600 sacks of tickets, weighing 10 tons, leave London Transport bus, tram, and trolleybus depots for repulping. Some 9,000,000 used railway tickets are also collected weekly. After pulping and printing, they appear as new tickets.

* * *

"RAIL FAILURES"

FROM R.H.N., S.O.L., G.W.R., 1919-1932

When I opened by *Gazette* for February 4, I noticed that one of the principal contents was shown as being: "Rail Failures." I immediately turned to the applicable page to see how many there are of us, and what you were saying about us. I was much relieved to find that the subject matter of the article was something entirely different to what I had anticipated—which enabled me to go on breathing again, quite normally.—R.H.N.

* * *

Best Friend, one of the first locomotives built in the United States, was purchased in the early 1830's for a South Carolina road. It met a sad fate, for the engine was wrecked by a negro who sat on a safety valve.—*Extract from "Human Geography of the South," by Rupert B. Vance, Ph.D.*

The Budapest authorities have decided to comply with the request of the local railway managers that the saloon coach, built in 1896 for the use of the Emperor Francis Joseph and Kaiser William II during the celebrations of the millenary of Hungary, should be taken from the traffic museum, where it has been ever since, and put into daily use to alleviate overcrowding.—*From "The Times."*

* * *

HEARD IN A BUS

Passenger: "Your punch bell didn't ring."

Conductor: "What do you expect for a penny, Foden's Band?"—*From the "Manchester Guardian."*

* * *

A recent B.B.C. "Freedom Forum" broadcast on short waves referred to the confusion that could result from the minor differences between the American and our own version of the English language. One of the Americans in the studio gave an instance. This was Thomas Eliot, the representative in London of the American Office of War Information. He said he had been walking along Piccadilly, an evening or two before, and noticed a U.S.A. soldier having "a terrible time" stopping passers-by and trying to make himself understood. At last Eliot heard him ask someone: "Say, bud, where do I find the pipe?" It was only after a certain amount of cross-questioning that the one American discovered that the other wanted what in their country they called the "subway" and what Britons know as the "underground" or the "tube." It was in trying to arrive at "tube" that the inquirer got as far as "pipe."

* * *

GROWTH OF BUREAUCRACY

The following figures show the upward climb in Government and public offices as shown by the number of pages allocated to them by Whitaker:—

Year	Pages
1869 (the first issue) ..	8
1939	80
1943	101
1944	108

I do not want to be pessimistic, but I doubt very much if the editor will have many pages released for other purposes for some time. The roots of bureaucracy once established are hard to pull up.—*From the Londoner's Diary in "The Evening Standard."*

* * *

The Southern Railway recently salvaged its 2,000,000th old razor blade, the sales of which have realised about £700 for the R.A.F. Benevolent Fund. This large total contributed by the travelling public and staff represents an average of one million blades for each of the past two years. Some of the blades are nearly 30 years old and even Hitler has made a contribution, for a German blade was found in the collection; the wrapper recorded in German: "10 blades 50 pfennig, money back if not satisfied."

His military servant at work

General Montgomery at his desk

Cooks in the kitchen car

Instructions for driver

The General leaving the train

A meal while travelling

General Sir Bernard Montgomery is using a special train of L.N.E.R. stock to visit units under his command

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

UNITED STATES

Bridge & Building Association Conference

The American Railway Bridge & Building Association held a two-day conference in Chicago on October 20-21 last, under the presidency of Mr. G. S. Crites, Division Engineer, Baltimore & Ohio Railroad. Twelve addresses and papers were given; seven reports submitted by committees dealt with various wartime problems.

Mr. H. R. Clarke, President of the American Railway Engineering Association, spoke at the opening session on "Maintenance Essentials in Wartime." Mr. Warren C. Kendall, Chairman of the Car Service Division, Association of American Railroads, Washington, discussed passenger-vehicle supply as it is affected by track maintenance.

Wartime labour in the form of women and schoolboys, and other general labour matters, occupied a prominent place in the proceedings, as did addresses and discussion on economy in materials; substitutes; salvage; maximum use of equipment; water service; maintenance of coaling and sanding plants; planning to reduce interference with traffic; and reinforcement of bridges to avoid reconstruction. [A number of details concerning the employment of high-school boys on maintenance work on his system, given at the conference by Mr. W. G. Powrie, Engineer, Maintenance of Way, Chicago, Milwaukee, St. Paul & Pacific Railroad, were reported in *The Railway Gazette* of January 28 last].

Tunnel Improvements

An important tunnelling project is being carried out on the Northern Pacific Railway main line to the west. The Bozeman Pass Tunnel in Montana, 3,652 ft. long, is sufficiently restricted in size to hamper operation, and to limit the dimensions of the locomotives used over the route; it carries a single track and is 16 ft. wide and 19¾ ft. high. As a cheaper alternative to enlarging the existing one, the company has decided to bore a tunnel 100 ft. to the north of it 2,850 ft. long, 18 ft. wide and 24 ft. high, to give adequate clearance for the large articulated locomotives now in use. Approval has been obtained from the War Production Board, and work is to start immediately; boring will be from both ends simultaneously. The new tunnel is expected to cost $1,000,000.

Similarly, on the Missouri Pacific Railroad preparations are being made to bypass the historic Barretts Tunnels, 16 miles west of St. Louis on the Eastern Division main line to Omaha and Denver. These tunnels, on the western slope of the Kirkwood ascent, were bored in 1850, and clearances with modern locomotives and rolling stock are as low as 4½ to 8½ in. in some cases. Locomotive exhaust in this confined space presents such a problem both with the train locomotives and the banking engines used with all heavy trains, that it is often necessary for the enginemen to wear gas-masks. To enlarge the tunnels without interference with traffic would prove so troublesome that it has been decided to construct a line, 4,400 ft. long, to be carried on the open hillside without tunnelling. The sharpest curvature will be eased from the 29 ch. radius of the existing line to 56 ch. radius, which will enable the existing 55 m.p.h. speed limit to be removed, and will facilitate the operation of fast traffic over this busy route.

Railway Dock on Lake Erie

To handle the heavy traffic in iron ore and coal brought by water across the Great Lakes, the Baltimore & Ohio Railroad is to spend $3,000,000 on an extensive dock scheme at Toledo, Ohio, on Lake Erie. The site selected immediately adjoins the refineries of the Standard Oil Company. The plans and surveys are complete.

Illinois Central Locomotive Rebuild

At the Paducah shops of the Illinois Central System, the rebuilding was completed, late in 1943, of 2-10-2 freight locomotive No. 2936, in which certain notable improvements on the original design have been carried out. The engine now has 30-in. × 32-in. cylinders, 5-ft. 4½-in. driving wheels, an "A" type superheater with a heating surface of 1,285 sq. ft., and a firegrate area of 88·3 sq. ft. The boiler pressure has been raised from 260 to 275 lb. per sq. in., and this gives a tractive effort of 104,370 lb., which can be augmented by the assistance of a booster to 119,620 lb.; the booster cuts out automatically when a speed of 30 m.p.h. has been attained.

In its original form this locomotive once handled a train of 155 loaded bogie coal-wagons, caboose, office van and dynamometer car, totalling 14,125 tons (12,610 tons of 2,240 lb.) from Du Quoin to Centralia, Illinois, 36 miles; on another occasion it hauled a train of 200 bogie wagons (154 loaded and 46 empty) from Decatur to Clinton, Illinois, 21 miles. Since rebuilding, No. 2936 has taken a train of 4,800 tons (4,285 tons of 2,240 lb.) up the 1 in 123 grade of Scales Mound incline in Illinois, and one of 4,321 tons (3,860 tons of 2,240 lb.) up Peosta incline in Iowa, without using the booster, and developed a maximum drawbar pull of 119,000 lb. Several similar conversions without boosters are contemplated.

SWITZERLAND

Minor Railway Developments

From October 14 last, the Langenthal-Huttwil, Ramsei-Sumiswald-Huttwil, and Huttwil-Wolhusen Railways formed themselves into a single company with the title Chemins de fer Réunis de Huttwil (Vereinigte Huttwiler Bahnen), and entered into a contract with the Emmenthal-Burgdorf-Thun Railway for the operation of the new joint system by the latter company. The railways thus brought into association cover a total of about 80 miles in the populous country to the north of the Lucerne-Berne line of the Swiss Federal Railways. Preparations are being made for the electrification of the three small lines first-mentioned: the E.-B.-T. line already is worked electrically.

On October 3, the short Oensingen-Balsthal Railway inaugurated electric working with two new electric locomotives of 28 *tonnes* weight each, which are capable of working trains of up to 240 *tonnes* in total weights over gradients of up to 1 in 83. The passenger rolling-stock of the line consists of second-hand coaches obtained from the Swiss Federal Railways. Oensingen is between Berne and Olten, on the Zurich main line of the Federal Railways.

In connection with the recently-completed electrification of the 13-mile Wil-Wattwil branch of the Swiss Federal, three large steel bridges, which were too light to carry the increasing traffic, are being replaced by masonry viaducts. The new Bazenheid viaduct has been in use for 18 months; Dietfurt viaduct, as rebuilt, was brought into use on September 16 last; and the third reconstruction, of the Guggerloch viaduct, 190 ft. high, is now in hand.

A Serious Derailment

On October 17 last, an accident took place at the station of Schüpfheim, between Lucerne and Berne, Swiss Federal Railways, as a result of which six passengers were killed and thirty injured, three of them seriously. Train No. 369 from Lucerne to Berne was passing Schüpfheim at 45 m.p.h. when the switch leading from the single main-line into the station passing-loop was moved before the whole train was clear. As a result, the two rear vehicles were derailed and thrown violently against the locomotive of train No. 3392, which was waiting in the loop to proceed in the opposite direction. The derailed vehicles were of the latest light all-steel type, and it is a tribute to the stoutness of their design that the effects of the accident were not more serious.

Chemin de Fer Fribourgeois

Details have been published of the financial arrangements made in connection with the constitution of the Compagnie du Chemin de fer Fribourgeois Gruyère-Fribourg-Morat. This company, as recorded in *The Railway Gazette* of October 8 last, has been formed by the merger of the three private undertakings of the Compagnie des Chemins de fer Electriques de la Gruyère, Compagnie du Chemins de fer Fribourg-Morat-Anet, and the Compagnie du Chemin de fer Bulle-Romont.

The share capital of the new company has been fixed at fr. 9,751,000, of which the Canton Fribourg has subscribed fr. 7,588,000, and the Swiss Confederation, fr. 1,500,000; the balance has been taken over by the interested municipalities and by private interests. The Canton Fribourg has undertaken the guarantee of the interest service in respect of loans up to fr. 3,500,000, and also to make good any working deficit the new company may incur.

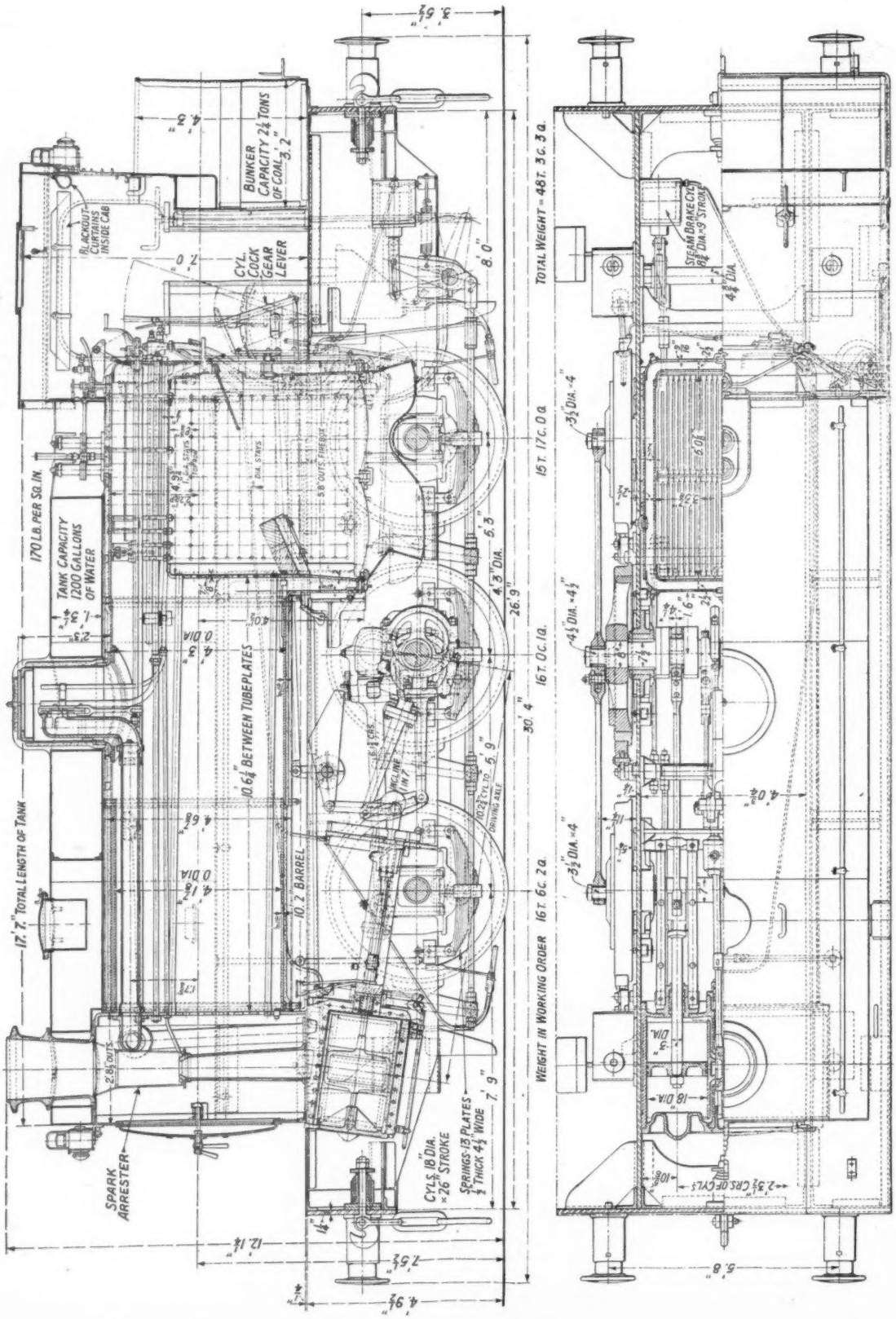
SPAIN

Locomotive and Rolling-Stock Construction

By a recent Decree the Government has authorised the Ministry of Public Works to order 130 locomotives from Spanish locomotive builders; the value of the order is estimated to be 159,600,000 pesetas. The complete Government programme, of which the sanctioned orders form only the first part, provides for the purchase of 400 locomotives, 400 carriages, and 5,500 wagons of from 20 to 50 metric tons capacity.

The Devis Works at Valencia recently delivered the last locomotive of a series of fifteen ordered in 1938. Since the conclusion of the civil war, the Devis Works has built 25 tender locomotives and 250 wagons, and has repaired 31 locomotives, 97 carriages and postal vans and 5,484 wagons. At present it is constructing 28 large steam tender-locomotives and 350 wagons, as well as 24 electric locomotives of 3,000 h.p. each for the Madrid-Avila and Madrid-Segovia lines in course of electrification.

XUM

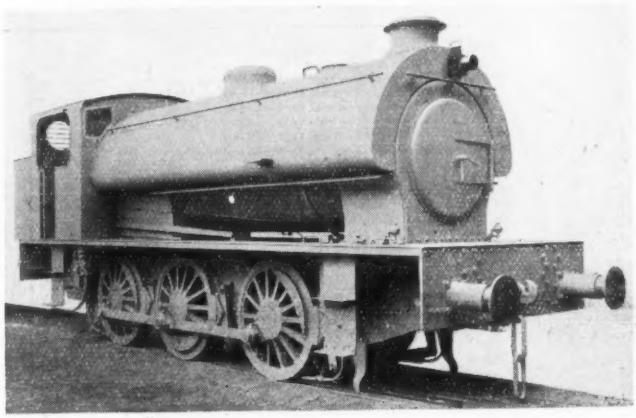

BUNKER CAPACITY 2¼ TONS OF COAL 3.2"
BLACKOUT CURTAINS INSIDE CAB
CYL. COCK GEAR LEVER
TANK CAPACITY 1200 GALLONS OF WATER
170 LB. PER SQ.IN.
10.6¼" BETWEEN TUBEPLATES
10.2" BARREL
17.2" TOTAL LENGTH OF TANK
SPARK ARRESTER
CYLS. 18" DIA. × 26" STROKE
SPRINGS 13 PLATES ¾" THICK 4½" WIDE
STEAM BRAKE CYL. 8¼" DIA. × 9" STROKE
TOTAL WEIGHT = 48T. 3C. 3Q.
15T. 17C. 0Q.
16T. 0C. 1Q.
30'. 4"
WEIGHT IN WORKING ORDER 16T. 6C. 2Q.
26'. 9"
8'. 0"
7'. 9"

Sectional elevation and plan showing principal dimensions and weights of the Hunslet "Austerity" 0-6-0 saddle-tank shunting locomotive

(See article on opposite page)

A Valuable Locomotive Spare Parts List

The Hunslet Engine Co. Ltd. has prepared an unusually comprehensive brochure covering details of its 0-6-0 saddle-tank shunting locomotive



Sectional elevation and plan showing principal dimensions and weights of the Hunslet "Austerity" 0-6-0 saddle-tank shunting locomotive
(See article on opposite page)

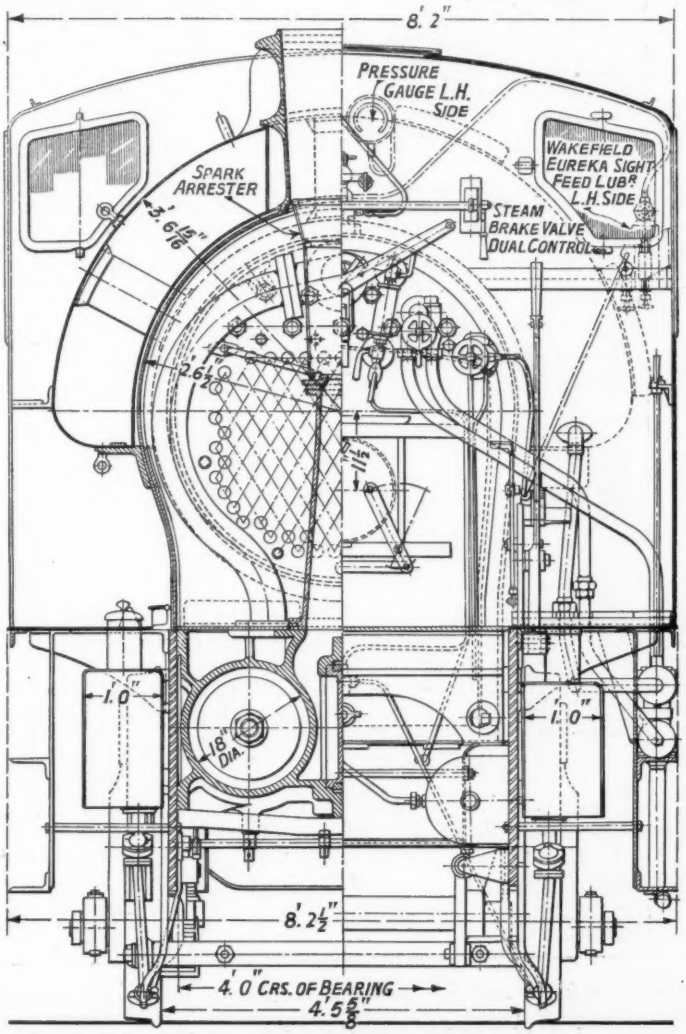
THE Hunslet Engine Co. Ltd., of Leeds, has prepared a spare parts list which is planned to cover every important part incorporated in its 0-6-0 saddle tank shunting locomotive, of which a number have been built for war work. The design of these engines is based on that of the standard Hunslet shunter, and the modifications in the original design which have been made have been mainly to facilitate quantity production despite certain shortages in materials and manufacturing resources, which have arisen as a result of war conditions. Some details of these locomotives were given in our February 5, 1943, issue, when it was shown that welding had been used widely, and that among the many components fabricated by this method were the saddle tank, the cab, the coal bunker, the ash pan, and the sand boxes.

In meeting wartime demands for these engines, several locomotive builders participated in their manufacture, and every assistance was afforded by the Hunslet Engine Co. Ltd. The list, which has now been issued, will be of great help to those responsible for the maintenance of this robust type of shunting engine. The list stresses that, when it is necessary to order replacement parts, it is important to state clearly the following information in the order given, so that complete advantage may be taken of the service offered, and errors and delays avoided:—Locomotive number, shown on the nameplate on the side of the locomotive cab, together with the year of construction; the description of the parts as shown in the list, and their part numbers; quantities required of each part; any modification in size due to wear and tear; address to which parts are to be delivered and the method of carriage desired.

The list shows the components of the locomotives in great detail, and comprises a number of well-produced plates, on which are given numbers corresponding to tables reproduced opposite the plates. These numbers apply to each particular part, which is also given a name, and in view of the variety of terms used in locomotive circles the use of the description recognised by the makers is of considerable assistance in avoiding confusion. Some indication of the detail into which the list goes, may be judged from the fact that two plates and two sets of descriptions are devoted to items relating to the boiler, firebox, mountings, smokebox, ashpan, firebars, and clothing of the locomotives. Plates and accompanying tables of reference are also provided for each of the following groups of spare parts:—Safety valves, combined steam and delivery valves, water gauges and protectors, sanding and blower valve, and Furness lubricators; cylinders, covers, slidebars, pistons and rods, crossheads, wheels, axles, crankpins, connecting rods, and coupling rods; slide valves, valve rods, valve connecting rods and guides, radius links and dies, lifting links, reversing shaft and carriers, reversing rod, reversing lever, eccentric sheaves, straps and rods; frames, buffing and drawgear, axleboxes, horn-blocks, spring gear, and brake gear; water tank, cab, and bunker; sandboxes, external piping and fittings; sand traps and ejectors, injectors, steam brake and lubricator; and lubrication chart. There is also a simple chart and a schedule of operations for lubrication.

We reproduce two of the plates and accompanying keys, and also diagrams showing the principal dimensions and weights of the locomotives.

(*See editorial article page* 180 *; and also pages* 188 *and* 189)



Transverse sections of the Hunslet 0-6-0 saddle-tank "Austerity" locomotive built for the War Department

CYLINDERS, COVERS, SLIDEBARS, PISTONS AND RODS, CROSSHEADS, WHEELS, AXLES, CRANKPINS, CONNECTING RODS, AND COUPLING RODS

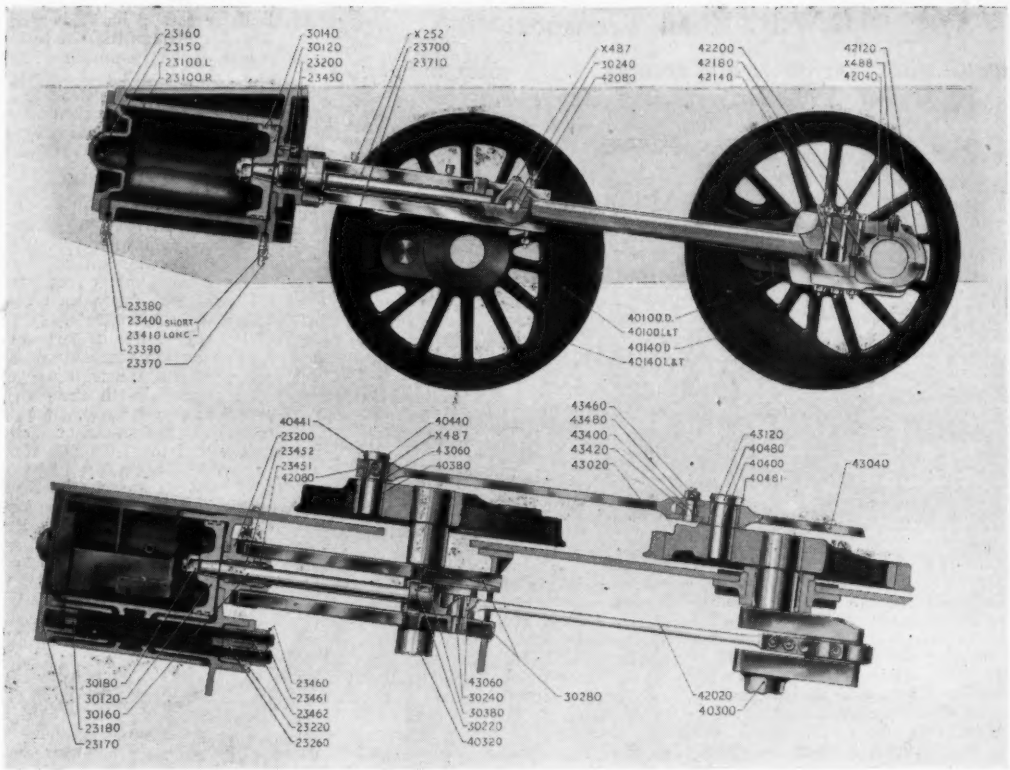
Part No.	Name of part	No. off per loco.
23100R	Cylinder—Right hand	1
23100L	Cylinder—Left hand	1
23150	Cylinder—Front cover	2 { 1R 1L
23160	Cylinder—Front-cover plate	2
23170	Front steam-chest cover	1
23180	Front steam-chest cover bush	2
23200	Cylinder hind cover	2 { 1R 1L
23220	Hind steam-chest cover	1
23260	Steam-chest neck ring	2
23370	Cylinder-cock body	5
23380	Cylinder-cock valve	5
23390	Cylinder-cock valve spring	5
23400	Cylinder-cock valve seat (short)	4
23410	Cylinder-cock valve seat (long). For steam chest	1
23450	Piston-rod metallic packing complete	2 { 1R 1L
23451	Piston-rod metallic-packing ring	2 sets
23452	Piston-rod metallic-packing spring	2
23460	Valve-rod metallic-packing complete	1
23461	Valve-rod metallic-packing ring	2 sets
23462	Valve-rod metallic-packing spring	2
23700	Slidebar—Top	4 { 2R 2L
23710	Slidebar—Bottom	4 { 2R 2L
X.252	Slidebar oil syphon	8
30120	Piston head	2
30140	Piston rings	4
30160	Piston rod	2
30180	Piston-rod nut	2
30220	Crosshead	2 { 1R 1L
30240	Crosshead gudgeon pin	2
30280	Crosshead slideblock	4
30380	Crosshead cotter	2
40100D	Coupled-wheel centre—driving	2
40100LT	Coupled wheel centre—Ldg. and trlg.	4
40140D	Coupled-wheel tyre—Driving	2
40140LT	Coupled-wheel tyre—Ldg. and trlg.	4
40300	Coupled-wheel axle—Driving	1
40320	Coupled-wheel axle—Ldg. and trlg.	2
40380	Crankpin—Ldg. and trlg.	4
40400	Crankpin—Driving	2
40440	Crankpin-collar—Ldg. and trlg.	4
40441	Crankpin taper pin—Ldg. and trlg.	4
40480	Crankpin collar—Driving	2
40481	Crankpin taper-pin—Driving	2
42020	Connecting rod	2
42040	Connecting-rod brass—Big end	2 prs.
42080	Connecting-rod bush—Small end	2
42120	Connecting-rod strap—Big end	2
42140	Connecting-rod strap bolt with washers—Big end	4
42180	Connecting-rod wedge block—Big end	2
42200	Connecting-rod wedge-block bolt—Big end	2
X.487	Connecting-rod oil cap—Small end	2
X.488	Connecting-rod oil-cap—Big end	2
43020	Coupling rod—Leading	2 { 1R 1L
43040	Coupling rod—Trailing	2 { 1R 1L
43060	Coupling-rod bush—Ldg. and trlg.	4
43120	Coupling-rod bush—Driving	2
43400	Coupling-rod joint pin	2
43420	Coupling-rod joint-pin bush	2
43460	Coupling-rod joint-pin nut	2
43480	Coupling-rod joint-pin collar	2
X.487	Coupling-rod oil cap	6

SAND TRAPS AND EJECTORS, INJECTORS, STEAM BRAKE VALVE, AND LUBRICATOR

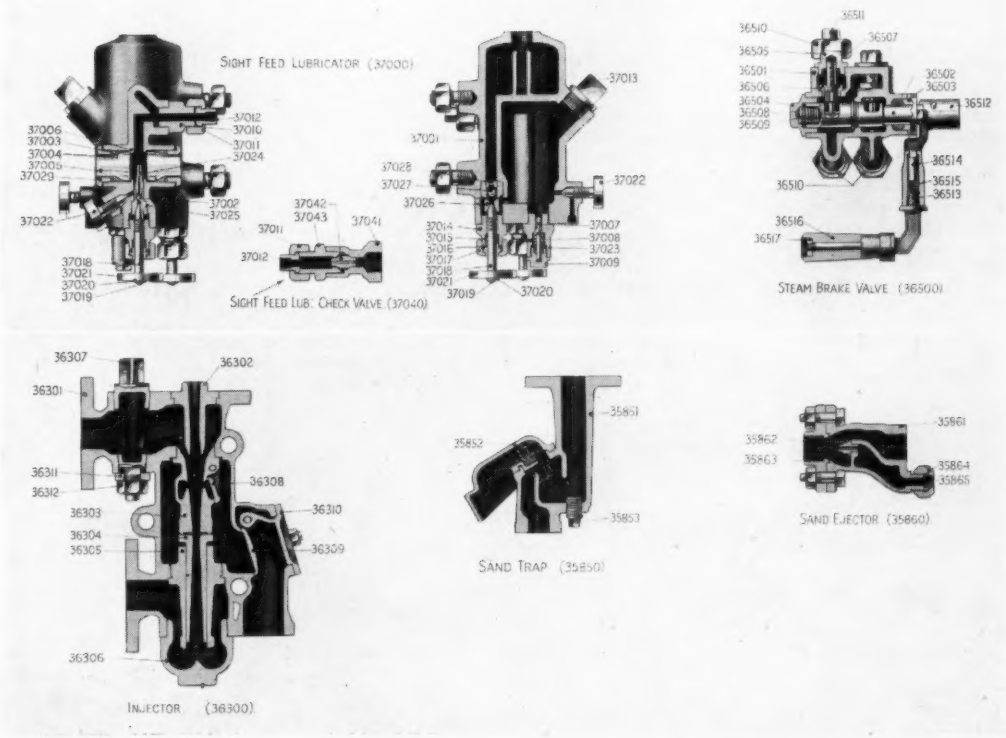
Part No.	Name of part	No. off per loco.
	Sand Trap	
35851	Body	4
35852	Cover	4
35853	Plug	4
35854	Joint ring	4
	Sand Ejector	
35861	Body	4
35862	Nozzle	4
35863	Flange	4
35864	Pipe-coupling nut	4
35865	Pipe ring	4
	Injector	
36301	Body	2
36302	Steam nozzle	2
36303	Combining cone	2
36304	Delivery cone	2
36305	Delivery-cone guide	2
36306	Cap	2
36307	Water-plug cock	2
36308	Flap for combining cone	2
36309	Overflow valve	2
36310	Overflow-valve cap	2
36311	Water-plug cock washer	2
36312	Water-plug cock nut	2
	Steam-brake Valve	
36501	Body	1
36502	Spindle	1
36503	Gland	1
36504	Support cap for spindle	1
36505	Valve cap	2
36506	Valve seating	2
36507	Valve	2
36508	Washer for spindle spring	1
36509	Spring for spindle	1
36510	Pipe-coupling nut	3
36511	Pipe-coupling cone	3
36512	Operating lever	1
36513	Spindle for handle	1
36514	Handle plunger	1
36515	Handle-plunger spring	1
36516	Wooden handle	1
36517	Nut for handle	1
	Sight Feed Lubricator	
37001	Body	1
37002	Oil-regulating ball valve	1
37003	Brass ring for sight glass	2
37004	Packing ring for sight glass	2
37005	Bulls-eye sight glass	2
37006	Fibre washer for sight glass	2
37007	Release-valve stem	1
37008	Release-valve spring	1
37009	Release-valve cap	1
37010	Oil-pipe union	1
37011	Oil-pipe coupling nut	2
37012	Oil-pipe coupling cone	2
37013	Filling plug	1
37014	Condenser and oil reg. valve guide	2
37015	Condenser and oil reg. valve-packing washer	2
37016	Condenser and oil reg. valve gland	2
37017	Condenser and oil reg. valve gland nut	2
37018	Condenser and oil reg. valve	2
37019	Condenser and oil reg. valve screw	2
37020	Condenser and oil reg. valve screw washer	2
37021	Condenser and oil reg. valve handwheel	2
37022	Drain valve and blow-through plug	2
37023	Release valve body	1
37024	Oil-regulating valve nipple top	1
37025	Oil-regulating valve nipple bottom	1
37026	Condenser-valve seating	1
37027	Condenser-ball valve	1
37028	Condenser-ball valve seating	1
37029	Sight-glass follower	2
	Sight Feed Lubricator Check Valve	
37041	Body	1
37042	Choke	1
37043	Choke adaptor	1

Examples of the keys provided to plates in the Hunslet spare parts list; the relative plates are given on the opposite page

A VALUABLE LOCOMOTIVE SPARE PARTS LIST (*See article on page* 187)



The numbered parts and key for items relate to the cylinders, wheels, connecting rods, and so forth (key opposite)



Details of the sand traps and ejectors, injectors, steam brake valve, and lubricator are numbered in the illustration and described in the key opposite

G.W.R. Road Transport

Organisation, operation and control of the company's fleet of 2,400 lorries and 1,200 horses

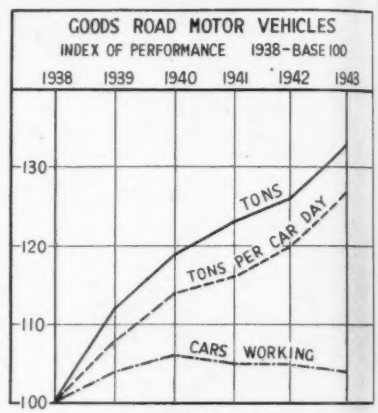
AN interesting article by Mr. D. Blee, Assistant to the Chief Goods Manager, G.W.R., which appeared in the *G.W.R. Magazine* for November, stresses the vital part which cartage operations ultimately play in securing the speedy turn-round of ships at ports, efficient transport service for industries of war, and the satisfactory distribution of the nation's food. Recognition of these facts influenced the G.W.R. in November last to bring cartage services, both goods and parcels, under the direct control of the Goods and Traffic Departments through the ægis of the Cartage Controller. The Road Motor Engineer is responsible for the maintenance of the fleet in service and its improvement by the acquisition of new types of vehicles, on which point, of course, he works in close collaboration with the Cartage Controller.

The G.W.R. cartage fleet comprises over 2,400 lorries and 1,200 horses. The road-motor fleet includes practically every known variation in weight capacity from the 5-cwt. van to the 12-ton lorry, including both rigid and articulated types. For exceptional tasks, higher-powered tractors such as Latil, Leyland, and Fordson are included in the fleet, and also a number of winch-fitted and trackless or caterpillar units. An extensive fleet of trailers is operated, both with the rigid and articulated lorries, and to meet requirements for the conveyance of exceptional loads, multi-wheel, extending pole, drop-frame, twin-set, and other high-capacity types are available. The acute shortage of rubber, the necessity for securing the utmost economy in the use of petrol, and the heavy traffic requirements have made the use of horses of considerable importance, and the stud of 1,200, which is maintained at a very high standard of fitness, makes a substantial contribution to the company's cartage operations, particularly in connection with short distance traffic.

Complementary to the normal collection and delivery of goods and parcels within the usual distances in town and country areas, the company has for many years specialised in the bulk delivery of constructional materials to contract sites; in contractual deliveries along the line of route of such articles as supplies of petrol, water, and sewage pipes, and drums of cable, and in the haulage of all types of girder work. The company also has steadily developed and extended its activities in the more difficult tasks, associated particularly with heavy haulage, of delivering and correctly positioning in power plants high-capacity boilers, both horizontal and vertical, operations which call not only for the use of exceptional types of road-motor gear, but such ancillaries as winches, hydraulic jacks, blocks, and tackle, together with the essential technical skill.

Specially designed motor vehicles are also constantly serving farms, markets, and abattoirs for the haulage of livestock. A particular feature of wartime operations is the necessity for delivering to outlying sites large quantities of traffic which, by reason of the volume in which they arrive and the existing heavy demands on stations adjacent to the sites, would overtax local resources and create congestion. By spreading the traffic over a number of stations, the flexibility of cartage enables regular daily delivery of the tonnage required to be maintained, and congestion and regulation of traffic avoided. Apart from ordinary cartage operations, the company regularly performs such services as the conveyance of milk from 300 farms to a central depot at specified times daily, and a town's supply of coal is bagged and delivered in 2-cwt. lots. Typical examples of the wide range of cartage services performed by the company are shown in the accompanying illustrations.

In common with the British railways' experience generally, the tonnage of traffic for collection or delivery is still rising, and the 7,000,000 tons dealt with in 1942 was appreciably exceeded in 1943. With priority demands severely restricting the possibility of strengthening the road motor fleet or, indeed, of carrying out even the normal renewal programme, the necessity for the most meticulous control of the fleet is self evident. The disposition both of road motor vehicles and horse stock is kept under daily supervision by means of a central control board at Paddington, and control is exercised by systematic daily survey of the cartage work to be performed at every station and by careful analysis of daily and weekly performances.



Graph showing the increased use of goods road motor vehicles

G.W.R. motor fleet at a West-Country milk depot

Left: 32-ft. tank conveyed by rail, transferred to road vehicle for delivery to installation site

Right: A 75-ft. girder weighing 16 tons, hauled by road to building site, on two 20-ton trailers

Left: Delivery by road vehicle of farm livestock

Regular periodical conferences are held at which those primarily responsible for the management of the company's cartage resources throughout the various districts, pool experiences and receive guidance, and direct assistance is given on special problems by expert staff. To meet inevitable fluctuations of demands created largely by convoy arrivals, a section of the road-motor fleet is retained as a strategic reserve under the direct authority of the Cartage Controller. This is dispersed at a number of convenient centres on the system so that assistance may be afforded in the shortest possible time whenever occasion demands. That the new organisation is resulting in improved standards of working can readily be visualised from the accompanying graph illustrating the rising curve of tons per car-day.

Tank wagons are playing an essential part in the war effort. Our illustration shows a long train of oil tankers on the G.W.R. system, hauled by a standard 2-8-0 freight locomotive.

Rail Welding on the Central Argentine Railway

Progress is being made in laying welded lengths of 120 ft. and 240 ft.

Top : The receiving end of the rail welding plant
Below : The despatching end, showing welded rail awaiting removal

INFLUENCED by the economic depression of the "thirties," when expenditure on the purchase of new rails fell below normal requirements, the Central Argentine Railway turned its attention to the possibilities of resistance flash butt-welding as a means of returning to the track rails withdrawn from service in the course of earlier renewals. Many of these rails, through long years of service on earth-ballasted tracks, were badly crippled around the joint, although the remainder of the unit was in fairly good condition and of good section.

The standard length of rail, formerly 33 ft. and now 40 ft., is governed by overseas shipping conditions, and these are such that the present maximum cannot be exceeded to any great extent. The advantages of a long rail were so obvious as to make the use of a cropped rail an unprofitable proposition in running lines, and the continued use of a new 40-ft. rail retrogressive. In these circumstances, welding offered the only way out.

In the choice of a resistance flash butt-welding plant the company was influenced by the existence of its own power supply, generated for the operation of its Buenos Aires suburban lines, and also by the soundness and comparative cheapness of this form of welding as shown by the experience of other railways, notably in Great Britain, Germany, Australia, South Africa, and elsewhere. The existence of an abundant power supply also decided the choice in favour of a static rather than a mobile plant.

The welding of rails weighing 85 lb. and 100 lb. a yard was commenced in June, 1939, and during four years' operation some 45,000 welds have been made, inclusive of those for test purposes.

Hitherto, welded rails, directly spiked to the sleepers, have been restricted in length to about 120 ft.; but on the Buenos Aires suburban lines, where the rails are chaired and each sleeper affords an anchorage, the standard length is about 240 ft. Apart from the advantages which attend a rail of this length, both from the standpoint of track maintenance and the smooth running of rolling stock, economy in the use of copper track bonds, fishplates, and fishbolts is a notable feature; running conditions are improved still further by the provision of a tongued joint which removes entirely from the track all rail gaps, except where switches and crossings intrude. These tongues are manufactured as small units and are welded to the rail end.

The Central Argentine Railway has now in service 133 miles of track laid in long-welded rails of 120 ft. and upward. Of this mileage, 94 are laid in rails previously discarded but now reconditioned and reincorporated in the system.

ROAD CONSTRUCTION IN ARGENTINA.—The Argentine Government, through the National Roads Department, has allotted the sum of 850,000 pesos for the construction of two roads through the Province of Salta to the Bolivian frontier. The proposed highways form parts of the international routes Nos. 9 and 34, the first passing through La Quiaca, and the second through Yacuiba.

The electric flash butt-welding plant at the Victoria workshops of the Central Argentine Railway

Three views of tongued joints, which are manufactured as small units and welded to the rail end

RAILWAY NEWS SECTION

PERSONAL

The board of the Southern Railway Company has appointed Mr. S. E. Clark as Acting Secretary of the company as from April 1 next, on which date Mr. T. E. Brain will retire; the appointment to continue during the absence on national service of the Secretary, Brigadier L. F. S. Dawes. Mr. W. S. M. Stapleton has been appointed Acting Assistant Secretary during the same period.

It is announced in *The London Gazette* of February 18 that the King has granted unrestricted permission for the wearing of the insignia of Knight Commander of the Order of St. Olav, conferred by the King of Norway on Sir Charles Hambro in recognition of services rendered during the war. Sir Charles Hambro, who is Chairman of the Great Western Railway Company, was appointed recently the United Kingdom Member of the Combined Raw Materials Board & Head of the British Raw Materials Mission in Washington.

Sir Montague Eddy, Head of the Mission of Directors of British-owned Argentine Railways which has been visiting Argentina, has returned to England.

G.W.R. Appointments

The Great Western Railway announces the following appointments, with effect from March:—

Mr. R. P. Davis, Assistant District Goods Manager, Swansea, to be Goods Agent, Smithfield.

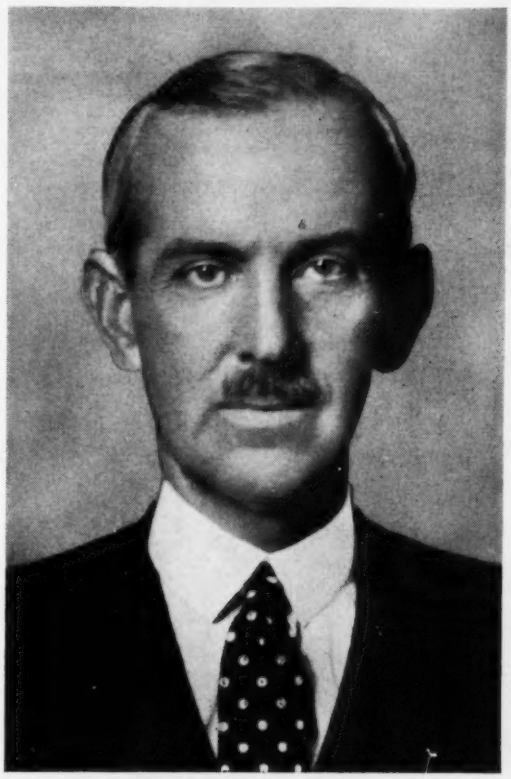
Mr. J. H. G. Russell, Junior Assistant, District Goods Manager's Office, Worcester, to be Chief Clerk, District Goods Manager's Office, Swansea.

Mr. J. A. Dundas, Assistant to the Vice-President in Charge of Finance, C.P.R., has been appointed Treasurer.

Mr. W. Potts Harper has relinquished his position as Hotels Manager, Northern Counties Committee, L.M.S.R., to take up that of Manager of the Slieve Donard Hotel, Newcastle, County Down, which is owned by the Belfast & County Down Railway Company. He was appointed Resident Manager of the Laharna Hotel, Larne, in 1933, and three years later to the position he now relinquishes. In view of war circumstances, the position of Hotels Manager, N.C.C., has not been filled, but Mr. George Beattie, Control Clerk in the Hotels Department, has been appointed in a temporary capacity as Catering Superintendent. He has been connected with the N.C.C. Hotels Department since 1930, and has been Resident Manager at both the Laharna Hotel and the Northern Counties Hotel, Portrush.

Mr. Alfred Plummer, L.M.S.R., chef on the Royal Train for 30 years, has received the Royal Victorian Medal. Mr. Plummer was for 22 years chef on the Irish Mail, and is now chef in the first class dining rooms at Euston.

Colonel Eric Gore-Browne, D.S.O., O.B.E., T.D., A.D.C., who, as recorded in our last week's issue, has been elected Chairman of the Southern Railway Company, was born in October, 1885, and was educated at Malvern College and Worcester College, Oxford. He was called to the Bar at the Inner Temple in 1909. He served during the war of 1914-18 with the London Regiment, and was awarded the Croix de Guerre and the Distinguished Service Order, and was mentioned in dispatches three times; and subsequently he was on the staff of the XVth Corps and General Headquarters in France. He was demobilised in 1919, but joined a Territorial regiment, the Leicestershire Yeomanry (Prince Albert's Own), which he commanded from 1933 to 1938. In 1939 he was mobilised for service in the present war, and held various staff appointments in England until called on to return to Glyn, Mills & Company. His elder son, Giles, is a Captain in the Leicestershire Yeomanry, and the younger, Thomas, is a Captain in the Grenadier Guards. Colonel Gore-Browne is an Aide-de-Camp to H.M. the King. In 1919 he entered the old private banking house of Glyn, Mills & Company, with which most of the English and many foreign railways, and also the Railway Clearing House, keep their accounts. In 1923 he became a Managing Partner of the bank, and last year was elected Chairman. He joined the board of the Southern Railway Company in 1930, and was elected Deputy-Chairman ten years ago. He is a Director of Alexanders Discount Co. Ltd., Gallaher Limited, and the Provident Mutual Life Assurance Association, and is a Member of the London Committee of the Ottoman Bank, and of the Committee of London Clearing Bankers. At the end of 1942 he was appointed Rubber Controller for the Ministry of Supply.



Colonel Eric Gore-Browne
Elected Chairman, Southern Railway Company

Institution of Mechanical Engineers

Dr. Harry R. Ricardo, F.R.S., well-known consulting engineer, research worker and inventor, has been elected President of the Institution of Mechanical Engineers for the year 1944-45.

Mr. Joseph Walton, Assistant Managing Director of Thos. W. Ward Limited, has been elected to the board of Marshall Sons & Co. (Successors) Ltd.

The directors of Callender's Cable & Construction Co. Ltd. have appointed Mr. H. J. Allcock, M.Sc., M.I.E.E., formerly Production Officer, to be Works Controller of their Northern Factories. Mr. Eric Bowyer, B.Sc., has been appointed Production Manager of the company's Anchor Works and associated factories.

Colonial Railway Appointments

The Crown Agents for the Colonies have made the following first class appointments:—

Mr. D. S. Lewis to be Administrative Assistant to General Manager, Nigerian Railway.

Mr. A. O. Arnold to be Assistant Locomotive Superintendent, Sierra Leone Government Railways.

We regret to record the death, while on active service in Italy, of Lt.-Colonel V. R. Illingworth, R.E., who has been serving with the Forces since the outbreak of war. He was, for some years, a member of the 151st (G.W.) Railway Construction Company, R.E. (S.R.), and went to France in September, 1939, where he was promoted Major and commanded the 158th Railway Construction Company, R.E. On his return to England he was promoted Lt.-Colonel and in due course he proceeded, as O.C. No. 1 Railway Construction & Maintenance Group, to North Africa and, through Sicily, to Italy. Colonel Illingworth's appointment on the Great Western Railway was Assistant Divisional Engineer, Neath, where he had been since April, 1937. He had been employed previously in various offices of the Engineering Department in South Wales, and had been from 1932 an Assistant in the Chief Engineer's Office, dealing with matters concerning the company's docks. He was an Associate Member of the Institution of Civil Engineers. Throughout his career Colonel Illingworth displayed high engineering ability and gained the confidence and friendship of all associated with him. His death is a great loss to a large circle of friends.

The late Dr. G. T. Moody, who was a Director of the Midland Railway Co. of Western Australia Ltd., the Salvador Rail-

way Co. Ltd., and Argentine Transandine Holdings Limited, left £602,394.

The late Colonel Sydney Ernest Smith, a former Director of the Bristol Tramways & Carriage Co. Ltd., left £370,745.

The Rt. Hon. the Earl of Radnor, who, as recorded in our last week's issue, has been elected Deputy-Chairman of the Southern Railway Company, has been a Director since November, 1929. He is also on the boards of the Channel Tunnel Co. Ltd. and the National Provident Institution. William Pleydell-Bouverie was born in 1895, the eldest son of the sixth Earl, whom he succeeded in 1930. The earldom

The Rt. Hon. the Earl of Radnor

Elected Deputy-Chairman, Southern Railway Company

was created in 1765. He was educated at Harrow, and served during the war of 1914-18, in which he was wounded, and held the rank of Captain in the 4th Battalion, Wiltshire Regiment. He has been Lord Warden of the Stannaries since 1933, and a Forestry Commissioner since 1942.

INSTITUTE OF TRANSPORT

Among those elected recently to membership of the Institute of Transport are Messrs. C. K. Bird, Acting Goods Manager, Southern Area, L.N.E.R.; C. T. Gardner, Deputy-Director, Inland Waterways, Ministry of War Transport; K. W. C. Grand, Assistant General Manager, G.W.R.; H. C. McCrostie, Secretary, Scottish Motor Traction Co. Ltd.; and O. G. Thiel, Port Goods Superintendent, Cape Town, South African Railways & Harbours. Those elected to associate membership include Messrs. R. W. Berkeley, Manager, Belfast Steamship Co. Ltd.; G. Forrest, Rhodesia Railways; K. G. Granville, Assistant Traffic Director, British Overseas Airways Corporation; N. Gray, Traffic Manager, Aldershot & District Traction Co. Ltd.; J. Green, Traffic Superintendent, North Western Road Car Co. Ltd.; S. Hughes, Divisional Manager (Caernarvon), Crosville Motor Services Limited; F. H. Kidd, Assistant Engineer, Western National Omnibus Co. Ltd. and Southern National Omnibus Co. Ltd.; T. J. Lynch, General Assistant to Secretary, Railway Clearing House; L. W. Rashbrook, Commercial Rates Superintendent, British Overseas Airways Corporation; R. Sarsfield-Hall, Area Engineer (Leicester), Birmingham & Midland Motor Omnibus Co. Ltd.; T. W. Venner, Cargo & Shipping Superintendent, British Overseas Airways Corporation; D. Waton, Assistant Secretary, Tyne-Tees Steam Shipping Co. Ltd., and C. W. Whaler, Assistant Engineer, Northern General Transport Co. Ltd.

We regret to record the death, on January 25, at the age of 68, of Mr. R. G. MacIver, M.I.Mech.E., M.I.Loco.E., an expert on brakes and superheating. He had been with a number of undertakings, including G. D. Peters & Co. Ltd., and at the time of his death was an engineer in the service of Flexo Plywood Industries Limited.

L.N.E.R. APPOINTMENTS

The L.N.E.R. announces the following appointments:—

Mr. C. G. G. Dandridge, Advertising Manager & Acting Assistant Passenger Manager, Southern Area, has been appointed Passenger Manager, Southern Area, in succession to the late Mr. A. L. Gibson. He will continue to act as Advertising Manager.

Mr. L. H. K. Neil, Assistant Continental Traffic Manager & London City Manager, has been appointed Continental Traffic Manager, in succession to the late Mr. A. L. Gibson. He will continue to act as London City Manager.

Mr. J. S. Jones, who has been engaged on special duties in the Chief Mechanical Engineer's Department, has been appointed Assistant Locomotive Running Superintendent (Western Section), Southern Area.

Mr. E. S. Bradley, District Engineer, Hull, has been appointed District Engineer, York.

Mr. J. W. Barr, Assistant Traffic Superintendent, Aberdeen, has been appointed Acting Assistant District Superintendent, Kings Cross.

Mr. R. E. Sargent, Assistant District Superintendent, Newcastle, has been appointed Assistant District Superintendent, Hull.

Mr. A. G. Minty, Assistant District Locomotive Superintendent, Newcastle, has been appointed Acting District Locomotive Superintendent, Sunderland.

We regret to record the death on February 11, in Dublin, of Mr. George Edmund Shanahan, late Assistant Secretary to the Irish Board of Works. Mr. Shanahan was Secretary to the Viceregal Commission on Irish Railways, which was appointed in 1906, and issued its final report in 1910. He also gave evidence before that Commission.

Mr. E. A. Richards has been elected Chairman of the Argentine & River Plate Centre of the Institute of Transport, in succession to Mr. G. C. Bonner. Mr. Richards is in the service of the Buenos Ayres Great Southern and Buenos Ayres Western Railways.

Mr. G. H. Butler has relinquished the Honorary Secretaryship of the Hull & District Centre of the Institute of Transport, and has been succeeded by Mr. A. S. Bellamy, Honorary Treasurer, who will combine the two offices.

At the annual general meeting of the SKAL Club of Birmingham the following officers were elected for 1944:—President: Mr. C. Rayner-Smith (Great Western Railway); Vice-Presidents: Messrs. G. R. Bradbury (late L.M.S.R.), J. P. Savage (Birmingham & Midland Motor Omnibus Co. Ltd.), F. T. Walker (Escombe, McGrath & Co. Ltd.); Chairman: Mr. G. W. Murrell (Canadian Pacific Railway); Vice-Chairman: Mr. W. Carpenter (W. Carpenter & Co. Ltd., Coventry); Honorary Secretary: Mr. F. T. Ranger (Cunard White Star Limited); Honorary Treasurer: Mr. H. W. Raybould (Maurice Cooke & Co. Ltd.); Honorary Press & Programme Secretary: Mr. F. Barrett (G.W.R.).

We regret to record the death on February 14, in his 75th year, of Mr. Arthur Cowie Stamer, C.B.E., M.I.Mech.E., M.I.Loco.E., who was Assistant Chief Mechanical Engineer,

The late Mr. A. C. Stamer

Assistant Chief Mechanical Engineer, L.N.E.R., 1923-33

L.N.E.R., from 1923 until his retirement ten years later. Mr. Stamer, who was the fifth son of the Rt. Rev. Sir Lovelace Stamer, was educated at Rugby, and became a pupil with Beyer, Peacock & Co. Ltd., after four years' service with which he joined in 1891 the former North Eastern Railway as a fitter at York. In the next year he was appointed Assistant Shed Foreman at York, and subsequently held a similar position at Hull. After gaining experience as Outdoor Inspector at Darlington and York, he became Divisional Locomotive Superintendent, York, in 1902, and four years later was made Assistant to the Chief Mechanical Engineer at Gateshead. When Sir Vincent Raven became Chief Mechanical Engineer in 1910, Mr. Stamer was appointed his Chief Assistant. During the war of 1914-18 he acted as Chief Mechanical Engineer for three-and-a-half years, and, in addition to the ordinary duties attached to that post, was responsible for the production of munitions for the Admiralty, War Office and private firms; in recognition of these services he was made a Commander of the Order of the British Empire. In March, 1923, he was appointed Assistant Chief Mechanical Engineer, with office at Darlington, and held that position until his retirement in 1933. He was President of the Institution of Locomotive Engineers in 1923-24. Mr. Stamer was one of the most popular officers of the North Eastern Area, and a tribute to the interest which he took in his staff was paid at the time of his retirement in the *L.N.E.R. Magazine*.

U.S. Transportation Corps and British Railways

Appreciation of hospitality in use of Transportation Club

REPRESENTATIVES of American railways at present serving in the Transportation Corps of the United States Army, E.T.O., to show their appreciation of the hospitality extended to them by the use of the Transportation Club, which was provided by the British railways, gave a dinner at the Club on February 14. Colonel Norman A. Ryan, Assistant Chief of Transportation, E.T.O. U.S. Army, presided, and in welcoming the guests said:

"This little get together tonight is for the purpose of a token group of railroad men who are serving in the American Army in the United Kingdom to meet with a token group of the heads of the British railways, and extend to them, on behalf of all railroad men in the service in the United Kingdom, as well as the companies they represent, their appreciation of the British railways' unbounded hospitality in providing this magnificent club and extending its use to us.

"It has meant so much in smoothing our path whilst away from home, and has proved very beneficial in promoting a common understanding of our transportation problems in the interest of the war effort; it has furthered our social acquaintance, and made us closer friends. Last but not least, it has brought us into contact with our opposite numbers on the British railways and British-Canadian armies, navies, and air forces, which in itself has paid dividends to all concerned in a better understanding of our common efforts, and has resulted in warm friendships.

"Gentlemen, we are deeply grateful, and through this meeting we express the appreciation of our American railroads for your kindness."

Colonel Ryan then read the following cables which he had received:—

BALTIMORE & OHIO RAILROAD

High respect and regards to distinguished British railroad executives dining as guests of American Railroaders of Transportation Corps of U.S.A. in Britain. The occasion is happy token British railway hospitality in establishing London club for use of our men serving the common cause. Is also pleasant reminder friendship shown B. & O. when *King George V* locomotive was sent to grace its 1927 Centennial and when *Coronation Scot* was consigned to our care in 1939 and until presented to U.S. Army as officers' headquarters last year. One of our finest recollections is B. & O. employees' gift of flying ambulance to R.A.F. through British railways in 1941 and the lives it saved in Mediterranean. Best wishes.

ROY B. WHITE,
President

ASSOCIATION OF AMERICAN RAILROADS

American railways will always hold in grateful remembrance kindness and courtesy of British railways in providing London Transportation Club for use of American railway officers in overseas service on occasion of dinner February 14. Please extend appreciation to our British friends and our best wishes to all.

JOHN J. PELLEY,
President

PENNSYLVANIA RAILROAD

Your kindness and hospitality in placing the Transportation Club at the disposal of our former employees now in the Services is sincerely appreciated by all of us.

MARTIN W. CLEMENT,
President

NEW YORK CENTRAL SYSTEM

Gracious gesture men of British railways providing club for American railroad officers. Deeply appreciated by all railroadmen here.

F. E. WILLIAMSON,
President

NEW YORK, NEW HAVEN & HARTFORD RAILROAD

The hospitality being accorded American railroad men by English railway officers in providing Transportation Club for their comfort is a gesture of good will which will long be remembered on behalf of Newhaven Railroad and staff. I extend earnest felicitations and good wishes.

HOWARD S. PALMER,
Trustee and President

ATCHISON, TOPEKA & SANTA FE RAILWAY SYSTEM

Will you please convey to the Transportation Club and British Railway Officers warmest good wishes.

E. J. ENGEL,
President

Colonel Ryan concluded by saying: "While having such an opportunity to talk to you I would be remiss if I didn't also express to you our deep appreciation for your wholehearted and understanding treatment of our problems in connection with our war-work. Your organisations have supported us to the limit—we could ask for no more."

Sir Ronald W. Matthews (Chairman, Railway Companies Association), Sir James Milne (General Manager, Great Western Railway), and Lord Ashfield (Chairman, London Passenger Transport Board) responded.

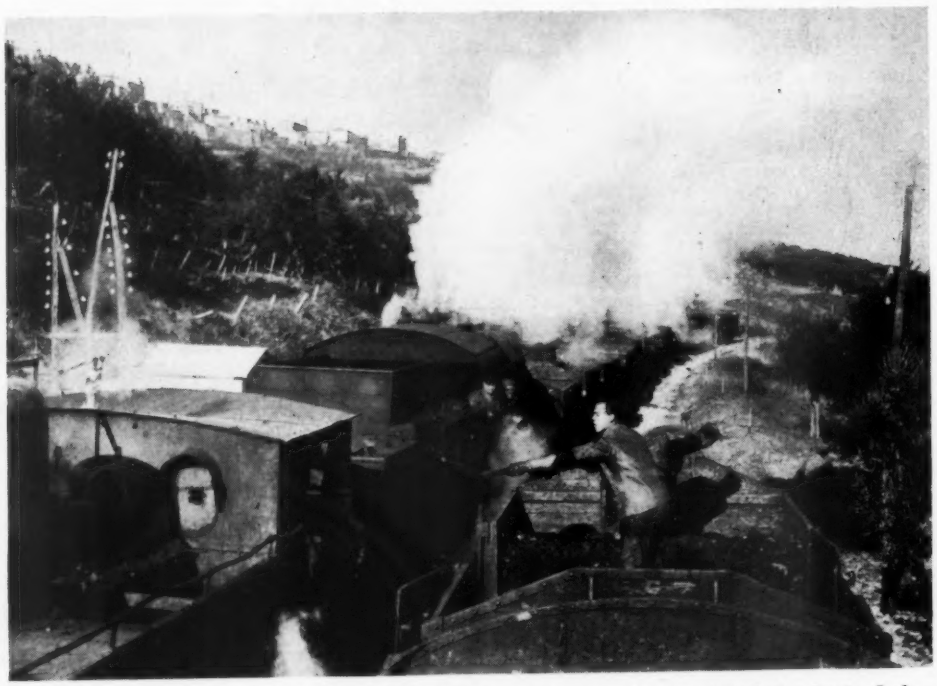
Sir James Milne, Sir Ronald W. Matthews, Colonel N. A. Ryan, Rt. Hon. Lord Ashfield, Brigadier-General Frank S. Ross

Lt.-Colonel S. H. Bingham
Mr. J. A. Kay
Major C. E. Page
Colonel H. Rudgard
Colonel K. R. N. Speir (not shown)

Lt.-Colonel. W. M. Snow
Mr. K. W. C. Grand
Major E. J. Finnegan
Major E. H. Boykin

Lt.-Colonel W. S. Carr
Mr. John Elliot
Major H. L. Phyfe

Sir Charles H. Newton
Mr. T. E. Thomas
Major A. C. Bonnaffon
Mr. V. M. Barrington-Ward (not shown)
Captain J. N. Langfitt (not shown)



Loading British coal on the tenders of Italian locomotives serving the Allied Armies in Italy

Drinking water being transported on the Italian railways in Allied occupation

ALLIED WARTIME OPERATION OF ITALIAN RAILWAYS (*See opposite page*)

TRANSPORT SERVICES AND THE WAR—230

Concrete Sleepers

On running lines and in sidings, 33,810 reinforced-concrete sleepers and 772,200 sleeper blocks are in service on British railways, to conserve timber.

London Utility Buses

There are at present 40 utility buses in service in London; they are standard "G" (Guy) type four-wheelers, fitted with wooden slatted seats.

Weekend L.M.S.R. Engine Cleaners

Every weekend some 2,250 volunteers help in L.M.S.R. locomotive sheds to prepare locomotives for their work. No fewer than 280,000 Sunday hours and 7,000 weekday hours have been worked by these spare-time engine cleaners on the L.M.S.R. in the past 6 months.

Civilian Air Raid Casualties in January

The Ministry of Home Security has announced the following figures of civilian casualties due to air raids in the United Kingdom during the month of January :—

Killed (or missing, believed killed)	107
Injured and detained in hospital	270

The casualties are classified as follow :—

	Men	Women	Under 16
Killed (or missing, believed killed) ...	45	39	23
Injured and detained in hospital ...	121	112	37

Southern Railway Men on War Service

Since the beginning of the war, nearly 11,000 Southern Railway men have been released for National Service, representing 17 per cent. of pre-war staff. Some 44 million more passengers were conveyed, and 11 per cent. more freight traffic handled, in 1943 than during 1942. More than 14,000 special trains were run for Government stores and personnel, an increase of 67 per cent. over 1942.

Canadian Women Railway Workers

Women workers employed by the Canadian National Railways and its subsidiaries, National Railways Munitions Limited and the Prince Rupert Drydock & Shipyard, to perform duties previously regarded as the exclusive task of men, now total 903. Of course, this is in addition to the large clerical groups employed in offices of every department throughout the system. During the past three months, the mechanical department of the railway increased its female staff by 57 per cent. to 543; some are classified as helpers to blacksmiths, boilermakers, and tinsmiths. Women "crib attendants" at National Railways Munitions Limited (the naval gun and field artillery gun carriage manufacturing plant operated by the Canadian National Railways) issue tools to employees; tools are stored in cribs when not in use.

An American Railway Recruits Schoolgirls

At the end of 1942 the Comptroller of the Baltimore & Ohio Railroad, to relieve the serious and increasing manpower shortage, wrote to the principals and employment advisers of public, private, and parochial girls' schools in the area served by the system, inviting them to send applicants to the railway offices for interview, with a view to their entering the service. Many girls who might not have thought of the railway as a career became interested, and, as a result, in Baltimore alone 450 girls have joined the railway staff in eight months. More than half of these are employed in the accounting department, sorting waybills and tickets, verifying paysheet and war bond deductions, and as shorthand-typists and accounting machine operators. One hundred additional girls were accepted for training at standard apprentice wages, to be given regular positions as openings occur.

Rome Railway Yards Bombed

It has been announced officially that American aircraft dive-bombed the Tiburtina and Ostiense railway yards at Rome on February 15. More than 50 bombers took part, and all returned safely.

Mussolini's Armoured Train

It has been reported from Italy that an armoured railway car was captured by the Allies in the Naples area, and is now being used to provide anti-aircraft protection for military trains operating northwards from Naples to the fighting zone. This car is a unit of the two-car armoured train presented by Hitler to Mussolini. An illustration of the train, showing the formal ceremony of handing over, was published in *The Railway Gazette* of August 9, 1940, page 150.

Italian Air Lines

The Italian air traffic company L.A.T.I. (Linee Aeree Transcontinentali Italiane, of Rome), which formerly operated regular air services between Rome and South America, has been unable to do so since the United States and a number of South American countries entered the war. A dangerous source of leakage was thus stopped. The company then limited its activities to the Rome-Lisbon route, which was continued up to the moment when events in Italy prompted the discontinuance of even this residual activity.

British Coal in Italy

It is widely realised that large quantities of coal are now being shipped to Italy from the United Kingdom, mainly for use by the Italian railways, and the view has gained wide currency that our resources are being diverted for the benefit of the Italian civilian population. We are officially informed that, contrary to the belief of many, this coal is not used for local Italian consumption. Since the Allied occupation, the whole of the railway system of Southern Italy has been run on British coal. The Railway Operating Companies of the Royal Engineers are using large numbers of German locomotives and wagons which the enemy was forced to abandon when the Eighth Army invaded Southern Italy. See illustrations opposite.

Ostbahn Goods Traffic

According to an official German news agency report from Krakow, the Ostbahn has become a party to the treaty between the German Reichsbahn and the railways of the south-eastern States (Croatia, Serbia, Bulgaria, and Greece) concerning goods traffic. From February 1 goods can be sent between the General Gouvernement of Poland and the above-mentioned countries on a through freight bill.

Wagon Turn-Round in Roumania

With the object of expediting the turnround of wagons, an Order was made recently by the Roumanian Under-Secretary for Civilian & Military Supplies providing that full wagon loads must be discharged within six hours of the time their arrival is notified to the consignee. Consignors are under obligation to inform consignees within six hours of completion of loading that a wagon is under way for them, notifying by telegram the number of the wagon, the kind of goods loaded, the date of loading, place of destination, and the amount (if any) to be paid on arrival. The Under-Secretary for Supplies is empowered to ask consignors to produce proof that the formality of the telegram has been complied with. Any expenses accruing from the belated discharge of a wagon must be borne by the consignee.

Nationalisation in Japan

The Japanese Government has announced its intention to buy all privately-owned railways of importance to the war effort.

Japan War Transport Fares and Taxes

Railway passenger fares in Japan are to be increased by a special war supplement of 30 per cent. on April 1. As the Japanese Diet recently decided to introduce a transport tax on passenger fares, the two supplements will result in an increase of 40 per cent. The combined yield from the war supplement and the transport tax is expected to be Yen 200,000,000 per annum.

Helsinki Tram Fare Increase

The Helsinki Tramways have recently been authorised by the Finnish Ministry of Popular Supply to increase the fare for single tickets from Finnmark 1.50 to 2. Ticket booklets, and monthly and quarterly seasons, are not affected.

American Locomotives for Russia

Eleven Russian officials were present on January 7 at the "launching" (with champagne) at Eddystone, Pennsylvania, of the first of 800 ten-coupled locomotives to be built at the Baldwin Locomotive Works for the Soviet Government. The design is a modernised version of the old "decapod" type built by Baldwins for Russia during the last war.

Moscow-Leningrad Railway

Immediately the Russians succeeded in their recent drive from Leningrad in recapturing the remaining portion of the Moscow-Leningrad main line, they began the work of reconstruction. At one time the Germans held more than 70 miles of the Moscow-Leningrad Railway, and also of the October 10 Highway extending between the same points. As the section in their hands was of very little use to the Germans, it was effectively destroyed, and the work of reconstruction will prove a major task.

Zurich Trams on Loan to Lucerne

Four Zurich tramcars have recently arrived at Lucerne on loan, in view of the considerable increase in the tram traffic of the latter town. Lucerne has the sixth longest tram system in Switzerland, coming after Geneva, Basle, Zurich, Berne, and St. Gallen. Its route length totals but 10 km. (6 miles). Its bus system is second (after that of Geneva) with a length of 37 km. (23 miles). In addition, there are 3 miles of trolleybus line. The Lucerne tramways are of metre gauge, the same as that of all the nine towns in Switzerland with tram services.

Berlin Railways

It is reported from Stockholm that the Berlin Underground Railway system was disrupted in several places as a result of the heavy R.A.F. raid on the evening of February 15, when upwards of 1,000 aircraft participated, and some 2,500 tons of bombs were dropped within the space of about half an hour. It is also said that the Anhalter station was partly wrecked. Trains from the south were stopped at Luckenwalde, 40 miles south of Berlin, and passengers were taken thence as far as Lichterfelde by motorbus. Trains from the west stopped at Potsdam. This is stated officially to be the heaviest individual raid of the war so far.

Ministry of War Transport Accident Report

Honeybourne, G.W.R., November 17, 1943

Mr. J. L. M. Moore inquired into the accident arising from the failure of a locomotive boiler at Honeybourne, on the G.W.R., on November 17, 1943, as a result of which a fireman lost his life. The locomotive concerned was U.S.A. engine No. 2403, working the 2.35 p.m. down goods from Banbury to Margam. When approaching Honeybourne East Loop distant signal at 11.55 p.m., the crown of the firebox collapsed, due to shortage of water; the train was travelling at about 25 m.p.h. at the time. The fireman, J. W. Sirrell, though badly scalded, walked nearly a mile to the signal box to get assistance; despite commendable first aid by the signalman, C. Taylor (an ambulance man of eight years' standing) he died later the same day. The disabled engine was taken to Honeybourne, and the train proceeded on its way after 4½ hours' delay.

The engine, of 2-8-0 type, is of American design, and up to the accident had run 10,088 miles. The boiler, which had a working pressure of 225 lb. per sq. in., had a steel inner firebox 7 ft. long and 5 ft. 10 in. wide. A single steel plate ⅜ in. thick formed the sides and crown, butt-welded to flanged tube and back plates respectively ½ in. and ⅜ in. thick. The crown is 3 in. higher at the front than at the rear, and is supported by 238 wrought-iron stays, screwed and riveted at each end. Two fusible plugs are on the centre line of the crown, 10 in. from tube and back plates; they are 2⅜ in. long overall, and project 1⅜ in. into the water space. The central hole of each is stepped, and is ¾ in. diameter at the top for a distance of ⅜ in., after which there is a similar length of ½ in. diameter; both these portions are tapped and filled with lead. The remainder of the hole, ⅜ in. diameter, is untapped. The 30 superheater and 150 ordinary tubes are all welded to the tube plates.

A single water gauge is provided on the left (fireman's) side and three test cocks on the driver's side; this is in accordance with G.W.R. practice. Steam, water, and drain cocks are of the wheel-operated screw-valve type. Because of its inaccessibility, the steam-valve spindle is extended by a universally-jointed rod 2 ft. 3 in. long, bringing the operating wheel close to the regulator, on the driver's side.

Examination showed the crown plate to have torn away from the roof stays; the lowest point was 1 ft. 7½ in. below its original position. The forcing down of the crown resulted in the top of the sides, and of the back and tube plates, being drawn towards the centre of the firebox. The plates were not fractured, and the welded joints showed no sign of giving way, despite the severe strain. All roof stays were intact; the edges of the riveted heads were drawn downwards, and in some cases partly broken off as the result of the plate being forced over them. The lead in the fusible plugs had not entirely melted; in each case some loose metal was still lodging in the upper part of the tapped hole.

The steam and water ways of the water gauge were reported clear, and nothing was amiss save that the steam-valve spindle was slightly bent and had a tendency to bind in the gland.

The engine was prepared at Banbury by Driver G. Mobbs, who worked the train to Leamington; for the next 15 miles to Stratford-on-Avon Driver J. P. Evans was in charge; they were relieved by Driver Hill and Fireman Sirrell. The accident occurred near the summit of a 1-mile rise at 1 in 143.

The train did not exceed the maximum load for this class of engine. Each driver stated that he tested the water gauge on taking charge of the engine, and had no reason to doubt that it recorded the true water level. Evans's attention, however, was drawn by his fireman to the appearance of the water in the glass, which was "swirling or bubbling." At Stratford-on-Avon, Evans informed Hill of what he had seen; but the movement in the glass was then negligible, and Hill noticed nothing unusual when he tested the gauge at Long Marston.

Conclusion

With the plug cocks almost universally fitted in this country, the handle reveals whether the cock is open or closed; but the position of American screw valves can be determined only by "feel." The railway companies therefore drew attention to the necessity for ensuring that the valve is open, and fixed a plate beneath it, worded: "This valve to be always in the open position." Until the accident, however, it does not seem generally to have been realized that, if the steam valve is open only partially, a false water level may appear in the glass.

To ascertain the extent of such false readings, an experimental plant was set up at Swindon. Steam at 225 lb. per sq. in. was supplied to a vertical cylinder 3 ft. high and 6 in. diameter; water could be admitted at the bottom to any desired level. An American water gauge was provided on one side and a British gauge on the other, but slightly lower, to enable the true level, when below the range of the American gauge, to be observed. Tests showed that if the American steam valve is not opened sufficiently, a false level appears in the glass, which is repeated after the gauge has been blown through. This false level varies with the steam-valve opening, and is the more deceptive as it rises and falls with the water in the cylinder. It was also found possible to reproduce the "swirling" effect, and when Evans and his fireman saw this done at Swindon they unhesitatingly said it was identical with the conditions observed at Leamington.

It thus appears conclusive that the steam valve was only slightly open during the last half of the journey, and that the crown of the firebox was uncovered as far back as Leamington, if not sooner, though the gauge throughout showed plenty of water. Tests on other engines showed that the mechanism of the steam valve, including the universal joint, was apt to work stiffly and give a wrong impression of the position of the valve. The valve spindle on this engine was bent, and the joint in the rod did not appear to have been oiled recently, so it would seem that Evans and Hill were misled into thinking that the valve was fully open. A slight variation in wheel setting had a marked effect on the reading in the glass. Mr. Moore considers that none of the men should be blamed for the shortage of water which led to the collapse of the firebox.

Remarks and Recommendations

Plug cocks have an advantage over screw valves on water gauges, but not sufficiently to justify any drastic alteration on the American engines, which are only temporarily on service in this country. Since the accident, shed notices have been posted, to impress on enginemen the necessity for ensuring that these valves are fully open, and the plates altered to read: "This valve must be full open." Personal instruction and demonstration, however, are the best means for bringing home this important point. Frequent use of test cocks is strongly advocated.

It is difficult to determine why the plugs failed to fuse completely. The lead was found to be similar to that used on British railways; in fact the plugs may have been refilled in this country. The central "waist" in the hole may have had some bearing on the failure, so that when the lead began to melt and provide a hole through the plug, the steam, whose temperature is 200° F. lower than the fusing point of lead, chilled the metal and prevented further fusion, whilst the unmolten mass was still too large to be forced through the smaller part of the hole. A new type of plug is under consideration for these engines.

In conclusion, it is clear that this type of failure was solely due to shortage of water, for the reasons stated. No criticism can be made of the material or workmanship of the boiler itself, which proved to be of the highest order.

Staff and Labour Matters

L.P.T.B. Railway Electrical Staff

The Industrial Court has recently issued its award on a claim by the joint committee of unions parties to the machinery of negotiation for railway generation and distribution staffs of the London Passenger Transport Board, which was referred to the court on the following terms of reference:

"To determine the claim of the unions that the rates of pay of the board's railway electrical generation and distribution wages staff be brought into line with the rates of pay of the tram and trolleybus electrical generation and distribution wages staff."

The rates of wages and conditions of service of the railway section and of the tram and trolleybus section, since the establishment of the board, have been dealt with separately, and there are separate negotiating committees for the two sections. This method of dealing with the wages of the two sections separately followed that which had been in operation before the board was established, in the railway undertakings, bus companies, or authorities concerned. The rates of pay of workers vary in amounts in the two sections; those in the trolleybus section are in a number of cases higher than those in the railway section, and these differences in pay have arisen from awards and agreements made in reference to the two sections. At the present time as a result of the awards and agreements referred to the rates of pay of men employed in a number of grades on similar work in the railway section and the tram and trolleybus section differ in amounts varying from 1s. to 11s. 7d.

The question in issue between the parties is as to base rates and no question arises as to the war advance, which is 20s. 6d. to all men alike in both sections.

The claim of the unions is that in those grades which are common to both sections the rates of pay in the railway section should be increased to those prevailing in the tram and trolleybus section. It was suggested by the unions that if the claim were conceded, then as regards grades which were not common the rates to be paid to such workers could be settled by agreement between the parties. The unions

submitted that the new rates should then be the standard or board rates. Apart from the desirability of the establishment of standardised rates for men employed on generation and distribution of electrical energy throughout the board's service, the unions contended that the principle of equal pay for similar work is a sound one and on these grounds asked the court to find in favour of their claim.

The claim was opposed by the London Passenger Transport Board on whose behalf it was stated that the board was not prepared to consider standard rates based on the existing tram and trolleybus rates which included the 6¼ per cent. of the Sparkes Award of January, 1926.

It was also stated that in the course of the negotiations with the unions in regard to this matter, the board had intimated its willingness to enter into joint negotiations with the unions representing both the railway, and tram, and trolleybus sections for the consideration of "standard" or "board" rates which should be applicable to all the staff employed in both sections, such rates to be on a lower basis than those obtaining in the tram and trolleybus section but which would show some improvement generally over the board's existing railway rates and would be without prejudice to existing personal higher rates.

Evidence was also put before the court as to the various grades of workers covered by the claim and their rates of pay, the rates of pay of the tram and trolleybus electrical generation and distribution wages staff referred to in the terms of reference, the rates paid to similar grades employed on main line railways and also to certain special war additions which had been offered by the board based on changes in minimum rates applicable to main line railway staff.

The court said that on the evidence before it, it is not satisfied that the claim that the rates of wages of the men employed in the railway section should be increased to those prevailing in the tram and trolleybus section has been established. Apart from this the court makes no further award on the claim.

The question of any revision of the rates of wages of the men employed in the railway section should, in the view of the court, be regarded as being related to the establishment of "standard" or "Board" rates applicable to both sections. The question of what such standard or board rates should be is not a matter which could be dealt with on the basis of the present reference. The Court is satisfied that the question of the institution of such standard rates should be considered by the parties and that for this purpose joint negotiations should take place between representatives of the board and representatives of the railway section and tram and trolleybus section.

The Court accordingly recommends that immediate steps to this end should be taken by the parties. Should the parties fail to reach agreement the matter can be referred to the court under a new reference.

L.N.E.R. Telephone and Telegraph System

Adequate and efficient means of communication are vital to the railways in maintaining the essential transport services behind the war effort which are now being stepped up with the approaching operations on the second front. The railways possess their own telephone and telegraph systems consisting of an intricate and elaborate network of wires reaching out from nerve centres to smaller exchanges, affording rapid means of communication between headquarter and general offices, control rooms, passenger and goods stations, marshalling yards, signal boxes, locomotive depots, and many other points.

The headquarters of the L.N.E.R. telephone and telegraph system in Scotland is situated in Waverley Station, Edinburgh, but this important centre represents one phase only of the large link-up by telephones and telegraph installations as separate circuits are provided for train control.

The Waverley Station automatic telephone exchange has a two positional manual switchboard with thirteen Post Office junction lines which can be connected with any one of 195 extensions. For internal communication any one of the 195 extensions can obtain connection with any other by automatic dialling. The whole apparatus, which is maintained by railway staff, is open day and night and the number of inter-office calls averages over 4,000 a day or some 1,300,000 a year. The peak hours on weekdays are from 9 a.m. to 12.30 p.m. and from 2.30 p.m. to 5 p.m. when the switchboard operators deal with Post Office calls from and to the public and on railway trunk lines at an average rate of 400 an hour which calls are additional to the 4,000 automatic inter-office calls per day.

An extensive trunk telephone system is maintained, the wires for which are carried on poles at the side of the railway line and by means of these circuits communication is made between Edinburgh and such places as Glasgow, Burntisland, Aberdeen, Carlisle, Newcastle, York, and London. Comparatively recent advances which have been made in telephone research have made it possible to apply "Carrier wave" and "phantom circuits" principles which increase the capacity of some of the trunks; for example, five conversations can be carried on simultaneously on the three lines between Edinburgh and Glasgow.

Naturally, in wartime precautions must be taken to ensure that no breakdown in communication arises through damage to the equipment and the L.N.E.R. has provided a duplicate set of instruments in a bomb-proof shelter and a special series of Post Office lines are set aside to take over the work in such an emergency, which will allow of contact being established to railway control points throughout the country.

The telegraph office is equipped with three morse circuits, twenty-two single-needle instruments with lines radiating all over the L.N.E.R. system in Scotland. There are also two teleprinters for transmission of messages to and from Glasgow and York by which means letters typed on a keyboard at one end are reproduced as printed letters at the other end. Approximately 3,200 railway telegrams are handled in this office daily, the majority of which are dealt with between 10 a.m. and 6 p.m. Public telegrams are received from senders at the office in the station and are despatched by pneumatic tube to the General Post Office, thus providing travellers with a day and night telegraph service. Pneumatic tubes are also employed to facilitate the delivery of telegrams to Headquarter Offices and places within the station.

A staff of 35 telegraphists and telephone operators is employed; the telephone switchboard is operated by six women from 7 a.m. to 10 p.m. and both the telephone and telegraph work is carried on by men from 10 p.m. to 7 a.m.

SOUTH AFRICAN RAILWAYS EARNINGS.—For the period January 9 to February 5, 1944, earnings of the South African Railways amounted to £3,572,325, an increase of £194,756 compared with the corresponding period in 1943.

THE RAILWAY SHARE-OUT
"THE WAR HAS MADE IT CLEAR THAT THE RAILWAYS ARE A NATIONAL ASSET"
Lord Leathers
1943 Railway earnings estimated at approximately £120 millions
RAILWAY STOCK HOLDERS
BRITISH GOVT NEARLY £80 millions
RAILWAY STOCKHOLDERS £43 millions
MARCHANT
Reproduced in THE FINANCIAL NEWS on February 12, 1944

But would not the Government have got it in any event—if not as a result of the present arrangement, then by the operation of Excess Profits Tax?—ED. *R.G.*

Questions in Parliament

Ilford Railway Accident

Major Geoffrey Hutchinson (Ilford—C.) on February 16 asked the Parliamentary Secretary to the Ministry of War Transport whether he was now able to make any further statement with regard to the railway accident which took place recently at Ilford.

Mr. Noel-Baker wrote in reply: No, Sir. I regret that the report on the railway accident at Ilford is still in course of preparation, and will be issued as soon as possible.

London-Manchester Express Fire

Mr. J. J. Tinker (Leigh—Lab.) on February 16 asked the Parliamentary Secretary to the Ministry of War Transport, if he had considered the letter that he had sent him alleging that the corridor doors were locked on the 10.15 a.m. London to Manchester express on Sunday, February 6, 1944, causing great difficulty in getting away from the burning compartment and increasing the number of casualties; and would he give instructions that on all train journeys the doors of carriages and corridors should not be locked.

Mr. P. J. Noel-Baker (Parliamentary Secretary to the Ministry of War Transport): As Mr. Tinker may be aware, the railway companies have drawn up regulations which govern the locking of doors in the corridors of passenger coaches and in the gangways between coaches. These regulations take full account of all safety considerations, and I am satisfied that they should be maintained. Unfortunately, on the 10.15 a.m. train to Manchester on February 6, these regulations were not observed, and a door was locked which should have been left open. I have given instructions that the importance of adhering strictly to the regulations shall be impressed upon the railway staff.

Mr. Tinker: I hope that the Parliamentary Secretary will realise that the locking of the doors is far too frequent. If such an accident as this happens, may I ask who is guilty of manslaughter if death results? I ask the Parliamentary Secretary to put this matter right. I hope that he will issue instructions that all doors shall be unlocked, and let us see how that works.

Mr. Noel-Baker: I will send Mr. Tinker a copy of the regulations, as they stand. They were carefully examined after a serious accident two years ago, and changes were made, which, I think, removed the dangers that then existed.

Mr. E. Shinwell (Seaham—Lab.): Is the Parliamentary Secretary aware that, apart from the danger of fire, the practice of locking corridor doors is highly objectionable, and that frequently it is impossible to get through a corridor, with the result that passengers are jammed in one part of the train when there is empty space in another part? Will he look into the matter?

Mr. Noel-Baker: Yes, Sir, I realise the difficulty; but there are strong considerations on the other side.

Mr. S. S. Silverman (Nelson and Colne—Lab.): Is the Parliamentary Secretary aware that more than once fatalities have occurred which would not have occurred but for the locking of the corridor doors?

Mr. Noel-Baker: Yes, Sir, that happened two years ago, as I have said. Since then, the regulations have been altered.

Mr. Silverman: Was the locking of the doors, on this occasion, in accordance with the regulations? If so, what was the reason which required the doors to be locked?

Mr. Noel-Baker: No, Sir, as I said, the regulations were not observed, and the doors were locked when they should have been left open.

Mr. Tinker gave notice that he would raise the matter on the adjournment at the earliest possible opportunity.

Use of Mineral Wagons for Potatoes

Mr. H. W. Butcher (Holland with Boston—Lib. Nat.) on February 16 asked the Parliamentary Secretary to the Ministry of War Transport whether steps were taken to see that all empty wagons arriving in potato growing districts, including coal wagons, were loaded with such produce and not returned empty.

Mr. Noel-Baker: I regret that it is necessary as a general rule to avoid loading mineral wagons with general merchandise to speed up the turn-round of the wagons and to keep the coal pits supplied with the numbers which they require. Some exceptions to this rule, however, are made; for example, we allow 50 mineral wagons a day to be loaded in East Anglia with potatoes for London.

Mr. Butcher: Does the Parliamentary Secretary really consider that 300 tons of potatoes from the whole of East Anglia is any contribution towards shifting the hundreds of thousands of tons which must be shifted in the very near future? Will he consider that point?

Mr. Noel-Baker: I am told that 50 wagons a day have been used to build up stocks, and that they have appreciably helped the situation. On the general point, we cannot accept the principle suggested. We are already in great difficulty with the coal pits, and if we left them any shorter of wagons, I am afraid that a great disaster would happen.

Admiralty Messengers

Viscount Hinchingbrooke (South Dorset—C.) on February 16 asked the First Lord of the Admiralty whether, in view of the great congestion on the railways, he would put an end to the practice of reserving whole compartments for Admiralty messengers travelling alone.

Mr. A. V. Alexander (First Lord of the Admiralty): I regret I am unable to accept Viscount Hinchingbrooke's suggestion.

Viscount Hinchingbrooke: Would the First Lord look into the possibility of transferring this courier service to the roads? Has he made every attempt to see whether existing military motor services could not be used to release accommodation on the railways?

Mr. Alexander: Of course every inquiry has been made, but it is essential in all these long-distance journeys, especially the heavy traffic journeys which we have to make, to consider other matters like petrol, rubber and man-power.

Electric Battery Vehicles

Mr. H. W. Butcher (Holland with Boston—Lib. Nat.) on February 16 asked the Parliamentary Secretary to the Ministry of War Transport what steps he was taking to encourage the design and development of electrical vehicles.

Mr. Noel-Baker: The Minister of War Transport has asked the Regional Transport Commissioners to give favourable consideration to all applications for licences to acquire electric battery vehicles, and arrangements have been made for the production of as many of these vehicles as are likely to be required for essential work. Facilities have also been given to designers to produce prototypes of new models which appear to be improvements on those which now exist.

Mr. W. Thorne (Plaistow—Lab.): Do these vehicles cost more to build than petrol driven ones?

Mr. Noel-Baker: They cost a little more to build, but they are cheaper to operate.

Nigeria Detention Orders

The Rev. R. W. Sorensen (Leyton West—Lab.) on February 16 asked the Secretary of State for the Colonies whether he had any further information respecting the restrictions imposed on Mr. Imoudu, President of the Railway Workers' Union in Nigeria and when these restrictions would be removed.

Mr. P. V. Emrys Evans (Under Secretary of State for the Colonies) replied that he had nothing to add to the reply given on July 1, 1943.

Mr. Sorensen said there had been considerable criticism in the West African Press regarding the detention of Mr. Imoudu and others. He asked what led to their detention.

Mr. Emrys-Evans said these men had been detained under Defence Regulations.

Alternative Fuels for Road Vehicles

Mr. Alfred Edwards (Middlesbrough East—Lab.) on February 9 asked the Parliamentary Secretary to the Ministry of War Transport whether he had any recent statistics relating to the number of private motorcars, commercial lorries, and buses running on substitute fuels in the United Kingdom; the annual consumption of the various substitute fuels; whether progress was being made in the design and manufacture of producer-gas apparatus; and whether his department was paying attention to the development of this means of propulsion in connection with post-war transport plans.

Mr. Noel-Baker: As the answer to the first part of Mr. Edwards' question includes the figures of vehicles licensed to run on a variety of alternative fuels, I will, with his permission, circulate it. I regret that I have no information about the quantities of fuel which these vehicles consume. I am glad to assure Mr. Edwards that satisfactory progress has been made, and is still being made in the design and manufacture of producer-gas units under the Government scheme, and that experience of lasting value is being gained.

Mr. Edwards: Is the Minister satisfied that producer-gas devices are suitable for buses, and has he considered the complaints of the effects of fumes on passengers?

Mr. Noel-Baker: That is another question, but I have considered the complaints that have been made.

Mr. Noel-Baker later circulated the following table of figures.

The number of vehicles licensed to operate on alternative fuels on December 31, 1943, was:—

	Public service vehicles	Goods vehicles	Private cars	Motor cycles and invalid chairs, etc.	Totals
Producer-gas	913	910	650	4	2,477
Coal gas (including compressed gas)	50	630	729	29	1,438
Electricity	—	7,522	91	13	7,626
Steam	11	1,030	4	101	1,146
Methane	—	94	15	—	109
Butane	—	4	8	—	12
Creosote	1,477	289	30	—	1,796
Other fuels	1	3	1	11	16
Totals	2,452	10,482	1,528	158	14,620

Parliamentary Notes

Pay-As-You-Earn Tax

In the course of a debate on the Income Tax (Offices & Employments) Bill in the House of Commons on February 10, Mr. T. W. Burden (Sheffield, Park—Lab.) said that he wished to call attention to a grave injustice which the Bill imposed on railway salaried staffs. The Finance Act, 1918, provided specially for railway salaried staff. It said :—

"Tax in respect of offices and employments of profit held under a railway company shall be charged by the Special Commissioners, who shall notify to the Secretary or other officer of the company the particulars of the assessment."

"Any such assessment shall be deemed to be, and shall be, an assessment upon the company, and the tax in respect thereof shall be paid, collected and levied accordingly and the company or the Secretary or other officer may deduct out of the emoluments of the holder of such office or employment of profit the tax so charged."

Mr. Burden said that he would like to emphasise two points contained in the rule. First that the assessment was on the company, and, secondly that the company could deduct the tax from the salaried staff. Although the companies had the necessary authority to deduct the income tax, obviously they had no legal authority to make any deductions before the assessments were made on them. Generally, the assessments were received about October or November. For the majority of the salaried staff deductions had been spread over 12 months—April to April—in approximately equal amounts. This had been a matter of mutual convenience, and, generally, no exception had been taken to the arrangement, but, unfortunately, there was no uniformity.

Examples of Differences

For example, on the London & North Eastern Railway the deductions terminated on April 15. There was thus an overlap of four weeks' payment in the case of staff paid on a four-weekly basis, and of two weeks in the case of those paid weekly. On the Cheshire Lines Committee there was an overlap up to eight weeks. On the Southern Railway, staff receiving up to £360 in London and £350 in the provinces were on the ordinary commercial arrangement. The tax was deducted from October to November, and there was, therefore, in their case an overlap of seven months. On the Mersey Docks & Harbour Board there would be an overlap of about 13 weeks.

The irony of the position was that where the companies had, Mr. Burden agreed for mutual convenience, exceeded their authority in making deductions, the staff concerned would be penalised under the new arrangement. To put the point in another way, those whose deductions began last April had paid seven-twelfths of their income tax earlier than all other Schedule E payers, and this amount had been deducted before an assessment had been made on the company, and therefore the deductions had been made without any legal authority.

Not only were the salaried staffs of the different companies receiving different treatment, but with one company, the Southern Railway, because of a purely administrative act on the part of the company, some of the staff would get a seven months' remission while others had paid the full amount; and this anomalous position would arise, notwithstanding the fact that all the salaried staff of the railways were taxed, through the companies, under the same Acts of Parliament. The Railway Clerks' Association, on behalf of the salaried staff, did not make any extravagant claim. It did not seek a repayment of the seven months' tax, or it may be other amounts. It did not even ask for a moratorium, but it asked for an adaptation of the remission arrangements to the peculiar circumstances of the railway companies and the staff. A remission in certain circumstances with a postponed credit had been suggested to accrue when the person is no longer subject to tax. The railway companies, which in these circumstances found themselves in a most anomalous position, joined with the staff in asking that equitable treatment should be accorded to them.

Mr. Burden did not want to over-state the position, but the railway companies had found themselves in a most embarrassing position. Would the Chancellor between now and the Committee stage meet representatives of the railway companies and the staff together, to ascertain if it was possible to find an equitable solution of the difficulty? Mr. Burden felt sure that it was possible, even within the four corners of the Chancellor's own formula, no overlap no discharge, to find a satisfactory settlement, and he was encouraged by the Chancellor's courteous and fair-minded treatment of all problems to say he believed that the Chancellor would not desire to leave the railway companies and their salaried staff with the feeling that they had suffered unfair and unjust treatment.

During later consideration of the Bill on February 17, Mr. Burden said he need hardly explain that a large number of the salaried staffs of the railways were serving in the Forces and that they had been replaced by temporary staffs. In the payment of tax, the railway salaried staffs were in precisely the same position as civil servants, with insignificant exceptions. They were right up to date, in the majority of instances. From the reply given by the Chancellor of the Exchequer to Mr. F. C. Watkins (Hackney, Central—Lab.), in the course of the Debate, it was certainly understood that any concession given to the Civil Service would be extended to the railway salaried staffs.

Chancellor's Reply

Sir John Anderson (Chancellor of the Exchequer) replied that Mr. Burden had raised what may have been a small point, but it was a point of substance, and he was perfectly ready to meet Mr. Burden upon it. He thought Mr. Burden would appreciate that the arrangement as between one railway company and another varied. In some cases payments had been made and tax had been collected up to date, as in the case of the Civil Service, and in some cases the tax had been collected as from the 12 months beginning in November, as in the case of the ordinary taxpayer under Schedule E. In other cases the taxation had not been collected until June, so that provision would have to be made, to meet Mr. Burden's point, for all those differences. It would take just a little time to work out a suitable amendment, but the Chancellor readily promised to propose one to meet his point fully at the report stage.

Mr. R. Assheton (Financial Secretary, Treasury), at the close of the debate, said that it would be necessary to talk to the railway companies and they might well wish to consider whether they should make some arrangements similar to those for temporary civil servants for their employees.

Jet Propulsion for Aircraft

In view of the recent publicity on the adaptation of jet propulsion to aircraft, it is of interest to note that important assistance was given by the British Thomson-Houston Co. Ltd. to this development. This company was first approached by Group-Captain Whittle in September, 1931, in connection with a paper he was preparing on "The Turbo Compressor and Supercharging of Aero Engines" for *The Journal* of the Royal Aeronautical Society. In view of the company's experience in connection with turbo compressors and superchargers operating at high speeds, it was able to supply him with certain data which was incorporated in this paper.

During 1933, the B.T.-H. Company carried out a very comprehensive investigation of the possibilities of various gas turbine cycles from the point of view of the use of this type of prime mover for generating power. In January, 1936, the B.T.-H. company was approached by Group-Captain Whittle in regard to the development of a jet propulsion engine for aircraft. In view of the experience which the B.T.-H. company had gained in the manufacture and operation of the 10,000-kW steam turbo-alternator which it had supplied to the Detroit Edison Company, U.S.A., the turbine of which had successfully operated in commercial service at an initial temperature of 1,000° F, it felt that it had available information on materials which would probably stand up to the stresses to be met in an aircraft propulsion unit. In view of this, and its experience in building high-speed turbines and compressors, it decided to collaborate with Group-Captain Whittle in the design and manufacture of a jet-propulsion engine.

In this machine, air is drawn into the compressor, compressed, heated in combustion chambers by the injection of fuel, partially expanded in the turbine wheel which drives the compressor, and expelled through an exhaust pipe to provide the propelling thrust by reaction. It is not permissible now to give further details; but it may be said that the first propulsion unit was completed and run on test in April, 1937.

As was only to be expected, this engine exhibited several defects, and extensive modifications were carried out in the design. Further engines were manufactured by the B.T.-H. company incorporating various modifications which experience on the test bed showed to be necessary. Eventually, difficulties inherent in such a development were overcome, and an engine was installed in a plane built by the Gloster Aircraft Co., Ltd. and successfully flown for the first time in May, 1941

A similar engine manufactured by the B.T.-H. Company was sent to its associated company in the U.S.A.—the General Electric Company (of New York)—in September, 1941, after information regarding the development had been disclosed to General Arnold of the U.S.A.A.F. in July of that year.

As Group-Captain Whittle said in his radio broadcast, the results achieved can be attributed to the close co-operation of the entire team associated with this work.

Swedish Railway Nationalisation.—A preliminary agreement concerning the sale of the Kristianstad-Hässleholm and Östra Skånes Railways to the Swedish State Railways has been confirmed. The sale must be ratified by the Riksdag.

Notes and News

G.W.R. General Meeting.—The annual general meeting of the Great Western Railway Company will be held at the Great Western Royal Hotel, Paddington Station, at 11.30 a.m. on March 8 (see Official Notices page 203).

Institute of Transport Luncheon Postponed.—The luncheon meeting of the Institute of Transport which was to have been held in London on March 3 has been postponed. Particulars of revised arrangements will be published as soon as possible.

Consolidated Signal Co. Ltd.—This company's principal asset consists of £391,112 stock of the Westinghouse Brake & Signal Co. Ltd. The directors announce that, assuming the Westinghouse Brake & Signal Company approves its proposed dividend of 10 per cent. and cash bonus of 4 per cent., they will recommend a dividend of 27½ per cent. (against 24 per cent.) on the £150,548 ordinary stock in respect of the year to September 30, 1943.

Bath Grand Pump Room Hotel and G.W.R.—At a recent meeting, shareholders of the Bath Grand Pump Room Hotel Co. Ltd. sanctioned the proposal to sell to the Great Western Railway Company for £36,000 the lease, goodwill and licences of the hotel. Mr. N. W. Wild, the Chairman, told the meeting that on completion the company would be placed in voluntary liquidation, and that in the liquidation the preference shares would be repaid at par and there would be available for the ordinary shareholders between 16s. 6d. and 17s. 6d. a share.

L.M.S.R. Special General Meeting.—A special general meeting of the London Midland & Scottish Railway Company will be held at Euston Station at 12 noon on March 20, to consider Bills: (1) to authorise the supply of water from the Shropshire Union Canal, and for other purposes; and (2) to authorise the closing for navigation of canals, to provide for the transfer of part of the Huddersfield Canals to the Company of Proprietors of the Calder & Hebble Navigation, and for other purposes (see Official Notices, page 203). Afterwards, a special general meeting will be held to consider the proposed application to the Minister of War Transport for authority to abandon the Monkland Canal.

San Paulo-Parana Railway.—A meeting of Parana Plantations Limited has been called for today (February 25) to consider an offer of £1,620,000 for the Brazilian assets of the company. The capital of the company is £1,835,000, and, if the sale is completed, it is estimated that this will be returned in full in the liquidation. The company's principal assets are the virtual ownership of a land company and a railway company. The latter, the San Paulo-Parana Railway, formed the subject of an editorial article in our January 21 issue. In a circular to shareholders the directors of Parana Plantations Limited give among the reasons for recommending shareholders to accept the offer the fact that political pressure has been put upon the railway company to substitute a Federal Concession on other terms for its present concessions from the States of Parana and San Paulo, and to undertake the early extension of the railway for several hundred km. through undeveloped territory to the borders of Paraguay. Recent experience has shown that capital expenditure even on railway construction and equipment which is justifiable economically absorbs most of the surplus profits of both the land and the railway companies. In order to fulfil the railway company's construction obligations under its present Concession, it will be necessary to build and equip approximately 57 km. of additional line by 1950. As we have previously recorded, the desire of the Brazilian Government is to extend the railway very much more rapidly than is justified by local commercial considerations. The latest available official information concerning this railway was published in our February 4 issue, page 126.

New Danube-Tissa Canal.—Construction of the new waterway connecting the River Danube with the River Tissa, mention of which was made in our issue of June 11, 1943, page 581, is expected to cost pengö 150 millions. The water-level is to be 164 ft. and it will be navigable for craft of the same size and tonnage as that plying on the Danube. Completion of the canal, which it is estimated will take some 8 to 10 years, will shorten the waterway between the upper course of the Tissa and Budapest by some 400 miles, compared with the present route *via* the mouth of the Tissa.

Ammunition Train Explosion.—The inquest was held on February 18 on the bodies of the 12 persons who were killed when, as recorded in our February 11 issue, an ammunition train blew up at a railway station in the North of England on February 4. Lt.-Colonel John Symons, R A.O.C. stated that a War Office court of inquiry had revealed that every precaution had been taken at the railway station, and that rules laid down by the War Department in conjunction with railway authorities for the handling of explosives had been carried out, but that the cause of the explosion could not be ascertained.

Great Western Railway.—The net revenue of the company for the year 1943 is £6,939,982, an increase of £7,236 compared with the net revenue of the company for the year 1942. The sum available for distribution, including the balance of £275,077 brought forward from the previous year, is £7,215,059. After meeting the interest and dividends on the pre-ordinary stocks, there remains a balance of £2,225,291 and the directors have decided to recommend the payment of a dividend for the half-year ended December 31, 1943, of £2 10s. per cent. on the consolidated ordinary stock, making £4 10s. per cent. for the year, leaving a balance to be carried forward of £293,453. The dividend warrants will be posted on or about March 15.

London & North Eastern Railway Company.—The net revenue of the company for the year 1943 is £10,655,441 or a decrease of £45,158 as compared with the net revenue for the year 1942. To this has to be added profit on realisation of investments £135,419, and the balance brought forward from 1942 of £78,476, making the total sum available for appropriation £10,869,336. After meeting the interest on the debenture stocks and the dividends on the guaranteed stocks, and setting aside £200,000 to contingency fund the directors recommend that, subject to final audit, dividends be paid by warrant as under:—

A final dividend of 2 per cent. on the 4 per cent. first preference stock, making, with the interim dividend of 2 per cent. already paid, 4 per cent. for the year;

A final dividend of 2½ per cent. on the 5 per cent. redeemable preference stock (1955), making, with the interim dividend of 2½ per cent. already paid, 5 per cent for the year; and

A final dividend of 1¾ per cent. (actual) on the 4 per cent. second preference stock, making, with the interim dividend of 1 per cent. already paid, 2¾ per cent. for the year;

in each case less tax at 10s. in the £, leaving a balance of £80,110 to be carried forward. Subject to the approval of the stockholders of these recommendations, warrants will be posted on March 15.

British and Irish Railway Stocks and Shares

Stocks	Highest 1943	Lowest 1943	Prices Feb. 22, 1944	Prices Rise/Fall
G.W.R.				
Cons. Ord.	65½	57¼	58½§	– 2½
5% Con. Pref. ...	120½	108	118½§	– 1
5% Red. Pref. (1950)	110½	106	108⅝§	– 1
5% Rt. Charge ...	137½	123½	131½	–
5% Cons. Guar. ...	135½	121 7/16	128⅛§	– 1
4% Deb.	118	107½	114½	–
4½% Deb.	119	109 7/16	115½	–
4½% Deb.	124½	116	122½	–
5% Deb.	138	127	131½	–
2½% Deb.	77	72½	74½	–
L.M.S.R.				
Ord.	34⅛	28	30½	– ½
4% Pref. (1923) ...	66½	58	61	– ½
4% Pref.	80¼	73	78	– ½
5% Red. Pref. (1955)	105¾	102	103½	–
4% Guar.	107	98½	103½	– ½
4% Deb.	109¾	103¼	107½	+ ½
5% Red. Deb. (1952)	111½	108	109½	–
L.N.E.R.				
5% Pref. Ord. ...	12 7/16	7⅜	9½	– ½
Def. Ord.	5⅜	3⅜	4½	–
4% First Pref. ...	66½	57½	60⅝	– 1½
4% Second Pref. ...	36½	30¾	32½§	– 1
5% Red. Pref. (1955)	99¾	93	58½§	– ½
4% First Guar. ...	102¾	94	100	– ½
4% Second Guar. ...	93½	85⅝	93	–
3% Deb.	86⅝	78⅜	81½	–
4% Deb.	109 7/16	101⅜	107	+ ½
5% Red. Deb. (1947)	106½	102	104	–
4½% Sinking Fund Red. Deb. ...	108	103½	104½	–
SOUTHERN				
Pref. Ord.	80	72½	77½§	–
Def. Ord.	26¾	20¾	23½	– 1½
5% Pref.	119½	106¾	118⅝	– 1
5% Red. Pref. (1964)	114	108½	113½§	– 1
5% Guar. Pref. ...	136	122	128½§	– 1
5% Red. Guar. Pref. (1957)	117	109¾	113½§	– 1
4% Deb.	117½	106	114½	+ 1
5% Deb.	137	126	130½	–
4% Red. Deb. (1962-67)	112	106½	109½	..
4% Red. Deb. (1970-80)	112	107	109½	–
FORTH BRIDGE				
4% Deb.	109	104¾	105	–
4% Guar.	105	102½	103½	–
L.P.T.B.				
4½% "A"	125½	114	123½	+ 2
5% "A"	133 7/16	123	130½	+ 1
3% Guar. (1967-72)	100½	97	99	–
5% "B"	124	114	121½	–
"C"	72	53	66§	–
MERSEY				
Ord.	34½	27	34½	–
3% Perp. Pref. ...	68	59½	66	–
4% Perp. Deb. ...	104	102½	103	–
3% Perp. Deb. ...	83	78½	79	–
IRELAND				
BELFAST & C.D.				
Ord.	9	6	7	–
G. NORTHERN				
Ord.	24½	16	22½	+ ½
Pref.	—	—	39½	– ½
Guar.	—	—	61½	+ ½
Deb.	—	—	82½	–
G. SOUTHERN				
Ord.	30	9½	56	–
Pref.	30	11	57	+ 2
Guar.	64	26½	69	–
Deb.	88½	51⅜	89½	+ 1½

§ ex-dividend

OFFICIAL NOTICES

London Midland and Scottish Railway Company

NOTICE is hereby given that a SPECIAL GENERAL MEETING of the London Midland and Scottish Railway Company will, in compliance with the Standing Orders of Parliament, be held at Euston Station, London, N.W.1, on Monday, the 20th day of March, 1944, at twelve o'clock noon for the purpose of considering, and if so determined, of approving, the undermentioned Bills :—

LONDON MIDLAND AND SCOTTISH RAILWAY (H.L.)

An Act to authorise the supply of water from the Shropshire Union Canal; and for other purposes.

LONDON MIDLAND AND SCOTTISH RAILWAY (CANALS) (H.L.)

An Act to authorise the closing for navigation of canals; to provide for the transfer of part of the Huddersfield Canals to the Company of Proprietors of the Calder and Hebble Navigation; and for other purposes.

ROYDEN, Chairman.
G. R. SMITH, Secretary.

Euston Station,
London, N.W.1.
21st February 1944.

WATER SOFTENER, "Kennicott" tower type water softener, capacity 4,000 G.P.H., height from ground to platform 20 feet, diameter of tower 12 feet. Unit complete with all accessories. The above plant can be seen by arrangement.—Wm. Cory & Son Ltd., Engineer's Department, Erith Slipway, Erith, Kent.

REQUIRED by the Jamaica Government Railway for 1 tour of 3 years in the first instance with possibility of permanency. Free passages.

FIRST ASSISTANT ENGINEER. Salary £650 × £50—£750 a year. Candidates should preferably be A.M.I.C.E. or hold an equivalent qualification and have had practical experience in railway engineering, railway construction work and survey in the field and in the office of a railway Chief Engineer.

Reference E.776A.

SECOND ASSISTANT ENGINEER. Salary £550 × £25—£650 a year. Candidates must have passed Sections A and B of the A.M.I.C.E. examination or hold a University degree in Civil Engineering and have had regular training as a Civil Engineer on railway works with experience of construction and maintenance and in the field on bridge construction. They should have a thorough knowledge of the design and construction of bridges and should be quick and accurate surveyors. They should also be capable of taking charge of the drawing office if required to do so.

Reference E.777A.

Write for form of application (which should be returned completed on or before 15th March, 1944) to the Ministry of Labour and National Service (Advt. Section), Central (Technical and Scientific) Register, Alexandra House, Kingsway, W.C.2, quoting references above.

Great Western Railway Company

NOTICE IS HEREBY GIVEN that the ANNUAL GENERAL MEETING of the Proprietors of this Company will be held in London, at the Great Western Royal Hotel, Paddington Station, on Wednesday, the 8th day of March, 1944, at Half-past Eleven o'clock in the morning, for the general purposes of business.

EDWARD C. G. CADOGAN, Deputy Chairman.
F. R. E. DAVIS, Secretary.

Paddington Station,
London, W.2.
21st February, 1944.

Overseas Employment

ASSISTANT TRAFFIC SUPERINTENDENT (ROAD SERVICES) required by the Tanganyika Government Railways for one tour of two to three years, with prospect of permanency. Salary £480-£20-£600-£30-£720 a year, plus cost of living allowance. Commencing salary according to qualifications and experience. Free passages and quarters. Candidates should have a comprehensive knowledge of the commercial and operating side of a road transport organisation for the carriage of passengers and merchandise.

Applications in writing (no interviews), stating date of birth, full details of qualifications and experience, including present employment; Identity and National Service or other registration particulars, and quoting reference No. O.S. 47, should be addressed to the Ministry of Labour and National Service, Appointments Department, Sardinia Street, Kingsway, London, W.C.2.

Southern Railway Company.—The directors of the Southern Railway Company announce that for the year 1943 the total net revenue amounts to £6,999,186, an increase compared with that for the year 1942 of £85,672. The balance brought forward from the previous year was £89,996, making the total sum available for distribution £7,089,182. After meeting the interest and dividends on the pre-ordinary stocks the amount available for dividend on the ordinary stocks for the year is £2,094,737. The directors have resolved to recommend the proprietors to declare the following dividends :—

A final dividend of 2½ per cent. on the preferred ordinary stock, making, with the interim dividend of 2½ per cent. already paid, 5 per cent. for the year.

2 per cent. for the whole year on the deferred ordinary stock.

For the previous year a dividend of 5 per cent. was paid on the preferred ordinary stock, and 1¾ per cent. was paid on the deferred ordinary stock. The balance carried forward is £85,602 compared with £89,996. It is proposed to pay the dividends, less tax at the rate of 10s. in the £ on Thursday, March 23.

London Passenger Transport Board.—The London Passenger Transport Board announces that the net revenue of the board for the year 1943, after giving effect to the estimated operation of the financial arrangements provided for in the Railway Control Agreement, and including a profit on the realisation of an investment, the balance of the London Transport "C" Stock Interest Fund, and a sum of £57,487 arising from an adjustment of the board's estimated proportion of the railway control pool for the year 1940, amounts to £4,747,280. The payment of interest on the prior charge stocks requires £3,901,381, leaving, for the service of the "C" Stock, a balance of £845,899. A final payment of interest on the "C" stock for the year ended December 31, 1943, will be made by the board's registrars, the Bank of England on March 17, 1944, to all holders registered in the books of the Bank of England at the close of business on February 21, 1944, of 2 per cent. actual, less tax at 10s. in the £, making, with the interim payment of 1¼ per cent. on August 20, 1943, a total of 3¼ per cent. actual for the year, compared with 3 per cent. for the previous year. The increase of ¼ per cent. in the rate of interest on the "C" Stock is due to the exceptional payment to the board relating to the year 1940 already referred to. The sum of £10,688 remaining after the payment of this interest, being less than one-eighth of 1 per cent. on the "C" Stock outstanding in accordance with Section 39 (7) (ii) of the London Passenger Transport Act, 1933, has been transferred to the London Transport "C" Stock Interest Fund. The Board also announces that it will shortly transmit to the Minister of War Transport the report and statement of accounts and the auditors' report for the year ended December 31, 1943. Copies of the annual report and statement of accounts will not be posted to the stockholders, because of the need to conserve paper, but copies will be on sale, price 6d., at the offices of the board, 55, Broadway, Westminster, S.W.1, on and after March 10, 1944.

Public - Utility Undertakings in Argentina.—The report of the special committee appointed by the Argentine Minister of the Interior, which has been studying questions relating to the nationalisation of privately-owned telephone companies in that country, is due to be submitted in March. Reuters states that well-informed Latin-American sources in Washington say that the immediate target of the proposed move is the second-largest public-utility system of Argentina, the Union Telefonica (a subsidiary of the International Telephone & Telegraph Co. Ltd.), the investments of which in Argentine telephone properties amount to more than $87 million. Particular concern is said to have been caused by the belief that nationalisation of the telephone system would be merely a prelude to a wider programme to embrace all foreign-owned public utilities.

Converted L.N.E.R. Locomotive at Liverpool Street Station.—No. 6595, one of the famous Robinson class "04" 2-8-0 locomotives, has been rebuilt by the L.N.E.R., and was on view at Liverpool Street Station on Thursday, February 17. The "04s," which were first introduced by the Great Central Railway in 1911, are numerically the largest class on the L.N.E.R., and were chosen as a standard type by the R.O.D. in the last war.

Photo] *[The Doncaster Chronicle*

The tea bar at Doncaster Station, L.N.E.R., which was opened on January 24 (see paragraph in our January 28 issue, page 99)

Railway Stock Market

Activity in most sections of Stock Exchange markets has been on a moderate scale, although the general undertone was firm. Sentiment continued to be assisted by the steady demand in evidence for high-grade investment stocks, and British Funds maintained their recent gains. Industrial shares showed numerous firm features in response to financial results and hopes attaching to forthcoming dividend announcements. The activity which developed in home railway stocks on the increased Southern and L.N.E.R. dividends has not been maintained. Nevertheless, when the stocks went "xd" they tended to attract better demand, as this was inclined to draw further attention to the very generous yields. Consideration of the figures for the past year's working emphasised the very small scope for increased payments under the wartime rental agreement; in every case the companies have been as liberal as possible within the limits of the latter. Had markets been active, it seems probable home railway stocks would have made good response to the dividends. The disposition is to await the annual meetings for any indications as to the views of the companies as to post-war problems.

It is expected it will again be indicated that it is quite impossible for them to ask for modification or revision of the rental agreement; but this, of course, does not preclude stockholders and others from pressing for revision. Incidentally, if proposals were brought forward for permitting a dividend payment on L.N.E.R. deferred and preferred stocks this railway's 4 per cent. second preference stock would have to receive its full dividend. Moreover, if the sum received by the L.N.E.R. under the rental agreement were increased, the corresponding amounts applicable to the other railways would apparently also have to be raised. An important point is that the rental agreement is to run until at least one year after the termination of the war, but the exact implication of this has not been officially defined. By accepting the wartime rental the railways have not given up their right to standard revenue, and the right to the latter may prove an important factor in post-war negotiations and plans as to the position of the railways. Standard revenue would permit of much higher dividends than those now ruling.

All points considered, it would seem there is no reason to take the view that the post-war outlook for the railways and their stockholders is by any means as pessimistic as might be deduced from the high yield basis on which the junior stocks are valued at the present time. The market is hopeful that at the meetings it may be stated whether during the currency of the rental agreement, the L.M.S.R. and L.N.E.R. must be expected to continue annual allocations to contingency reserves at the same levels which have ruled in the past two years. If these allocations cannot be reduced, there would seem to be no prospect of better dividend payments, unless there were special income, such as profits on the sale of investments.

Compared with a week ago, Great Western ordinary has moved back from 60¾ to 59 xd. Great Western guaranteed and preference stocks were lower at 129 and 118½ respectively, but were also quoted xd. L.M.S.R. ordinary moved lower, from 31⅛ to 30½; the 1923 preference was 61¼, compared with 61½ a week ago, and the senior preference 78, compared with 78¼; and the guaranteed stock was again 103½. L.N.E.R. second preference was 32½ xd., compared with 33¼ a week ago, and the first preference 60⅝ xd., compared with 61½. L.N.E.R. first guaranteed eased from 100¼ to 100. Southern deferred was 23¾ xd., as against 23⅜ a week ago, and the preferred 77 xd., compared with 77½. London Transport "C" showed improvement from 66 to 66½ xd.

A better tendency which developed in Argentine railway stocks was not maintained, and fractional declines have been shown on balance. B.A. Gt. Southern ordinary was 12¾, compared with 13 a week ago, and the 5 per cent. preference 25½, compared with 26. Elsewhere, United of Havana debentures were maintained at 29, but San Paulo ordinary moved back further to 48½. Canadian Pacifics declined on balance, profit-taking having followed the dividend announcement.

Traffic Table and Stock Prices of Overseas and Foreign Railways

	Railways	Miles open	Week ending	Traffic for week: Total this year	Traffic for week: Inc. or dec. compared with 1941/2	No. of Weeks	Aggregate traffics to date: Totals 1942/3	Aggregate traffics to date: Totals 1941/2	Aggregate traffics to date: Increase or decrease	Shares or stock	Prices: Highest 1943	Prices: Lowest 1943	Prices: Feb. 22, 1944	Yield % (See Note)
				£	£		£	£	£					
South & Central America	Antofagasta (Chile) & Bolivia	834	13.2.44	32,540	+ 5,620	7	210,500	188,510	+ 21,990	Ord. Stk.	15¾	10	12	Nil
	Argentine North Eastern ...	753	12.2.44	18,210	+ 8,178	33	469,458	411,168	+ 58,290	..	7⅞	5	6	Nil
	Bolivar	174	Jan., 1944	4,689	— 603	5	4,689	5,292	— 603	6 p.c. Deb.	22½	18	18½	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds	23½	19	17½	Nil
	Buenos Ayres & Pacific ...	2,807	12.2.44	121,920	+ 8,520	33	3,268,620	3,119,040	+ 149,580	Ord. Stk.	8½	5¼	7	Nil
	Buenos Ayres Great Southern	5,080	12.2.44	223,320	+ 8,400	33	5,633,160	5,107,440	+ 525,720	Ord. Stk.	17⅛	9½	12	Nil
	Buenos Ayres Western ...	1,930	12.2.44	63,900	— 2,700	33	1,760,760	1,746,660	+ 14,100	,,	16	9⅞	11¼	Nil
	Central Argentine	3,700	12.2.44	163,506	+ 15,801	33	4,763,658	4,308,177	+ 455,481	,,	10¾	6½	9	Nil
	Do.	—	—	—	—	—	—	—	—	Dfd.	4⅝	3	4	Nil
	Cent. Uruguay of M. Video	972	12.2.44	34,660	— 5,350	33	1,089,144	834,821	+ 254,323	Ord. Stk.	7⅞	4½	5¼	Nil
	Costa Rica	262	Dec. 1943	15,805	+ 849	25	130,194	79,919	+ 50,275	Stk.	16	12½	15	Nil
	Dorada	70	Jan., 1944	26,020	+ 5,430	5	26,020	20,590	+ 5,430	1 Mt. Db.	96	92	93¼	6⅓
	Entre Rios	808	12.2.44	22,266	+ 3,852	33	649,518	595,902	+ 53,616	Ord. Stk.	9	5¼	6½	Nil
	Great Western of Brazil ...	1,030	12.2.44	24,800	+ 5,200	7	145,600	111,900	+ 33,700	Ord. Sh.	59/9	24/4½	25/-	Nil
	International of. Cl. Amer.	794	Dec., 1943	$696,368	+ $50,157	52	$7,285,649	$6,200,530	+ $1,085,119	—	—	—	—	—
	Interoceanic of Mexico ...	—	—	—	—	—	—	—	—	1st Pref.	2⅛	1⅛	1½	Nil
	La Guaira & Caracas... ...	22¼	Jan., 1944	6,640	— 2,795	5	6,640	9,435	— 2,795	5 p.c. Deb.	90	80	88½	Nil
	Leopoldina	1,918	12.2.44	39,977	+ 6,694	7	267,975	189,412	+ 78,563	Ord. Stk.	7¾	4	5	Nil
	Mexican	483	7.2.44	ps. 349,300	+ ps. 64,400	6	ps.1,980,500	ps.1,569,600	+ ps. 410,900	Ord. Stk.	1⅛	¾	⅛	Nil
	Midland Uruguay	319	Nov., 1943	17,647	+ 2,530	22	83,514	65,903	+ 17,611	—	—	—	—	—
	Nitrate	382	15.2.44	15,298	+ 9,108	7	27,130	18,341	+ 8,789	Ord. Sh.	83/9	71/3	68/9	Nil
	Paraguay Central	274	11.2.44	$45,293	+ $6,103	33	$1,690,327	$1,262,550	+ $427,777	Pr. Li. Stk.	75	51½	69	8¼
	Peruvian Corporation ...	1,059	Jan., 1944	111,444	+ 25,677	31	748,634	583,434	+ 165,197	Pref.	17⅞	10¼	10	Nil
	Salvador	100	Dec., 1943	c 174,000	+ c 62,000	25	c 603,000	c 432,000	+ c 171,000	—	—	—	—	—
	San Paulo	153½	—	—	—	—	—	—	—	Ord. Stk.	71	57	49	4⅛
	Taltal	160	Jan., 1944	5,485	+ 2,155	31	40,710	34,416	+ 6,249	Ord. Sh.	37/6	20/-	20/-	Nil
	United of Havana	1,301	12.2.44	75,581	+ 22,704	33	1,592,143	1,507,729	+ 84,414	Ord. Stk.,	8⅛	3½	3½	Nil
	Uruguay Northern	73	Nov., 1943	1,568	+ 101	21	7,125	6,224	+ 901	—	—	—	—	—
Canada	Canadian Pacific	17,034	14.2.44	1,088,000	+ 116,800	7	6,950,400	5,672,600	+ 1,277,800	Ord. Stk.	18	13⅞	15½	Nil
India†	Barsi Light	202	Dec., 1943	19,058	— 1,057	39	191,400	151,518	+ 40,882	—	—	—	—	—
	Bengal-Nagpur	3,267	Dec., 1943	939,400	— 85,625	39	9,161,775	8,081,550	+ 1,080,225	Ord. Stk.	104½	101½	103½	3⅛
	Madras & Southern Mahratta	2,939	10.1.44	282,900	+ 34,826	33	7,801,260	6,679,643	+ 1,130,617	,,	110	106	108½	6⅛
	South Indian	2,349	20.12.43	197,410	+ 24,449	37	5,321,558	4,562,445	+ 750,113	,,	105½	101½	103½	4
Various	Egyptian Delta	—	10.1.44	20,452	+ 5,363	42	459,709	358,834	+ 100,875	Prf. Sh.	6¼	2⅞	4½	Nil
	Manila	—	—	—	—	—	—	—	—	B. Deb.	45	32	40	8⅛
	Midland of W. Australia ...	277	Dec., 1943	30,839	+ 423	25	196,644	190,328	+ 6,317	Inc. Deb.	101	93	100	6
	Nigerian	1,900	30.12.43	68,456	+ 7,866	26	1,933,466	1,833,420	+ 160,046	—	—	—	—	—
	South Africa	13,291	9.1.44	855,671	+ 49,041	42	33,930,523	31,610,827	+ 2,329,596	—	—	—	—	—
	Victoria	4,774	Sept, 1943	1,321,580	— 51,483	—	—	—	—	—	—	—	—	—

Note. Yields are based on the approximate current prices and are within a fraction of ⅛ Argentine traffics are given in sterling calculated @ 16⅓ pesos to the £
† Receipts are calculated @ 1s. 6d. to the rupee § ex dividend